

Cornell College: A Blueprint for Sustainability

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Executive Summary

Introduction

Sustainability, or “*meeting the needs of the present without compromising the ability of future generations to meet their own needs*” (United Nation’s “Our Common Future” 1987), is neither a new nor radical concept. The idea of sustainability is based on the fundamental fact that earth is a closed system with finite resources which cannot support continuously high rates of human growth and consumption. The sense of urgency surrounding sustainability grows ever greater, as global crises resulting from deforestation, aquifer depletion, species extinction, wide-spread famine, and climate change are possible. Yet, the goal of sustainability is not environmental preservation at the expense of humans. Unless humans manage the global resources in a sustainable manner, the development of human societies will not be able to continue. Thus, sustainability is critical for the continued existence and prosperity of all global systems.

The United Nations Earth Summit drafted their definition of sustainability in 1987 and it is still the one used most commonly today. The Coalition for Environmentally Responsible Economics wrote the CERES principles of sustainability in 1989, an international conference of 22 university presidents and chancellors wrote the Talloires Declaration of sustainability in 1990, and the Business Council for Sustainable Development published the book *Changing Course* in 1992. Yet, nearly 20 years after these large-scale efforts from multiple sectors of the global society, sustainability is just beginning to infiltrate popular media, common vocabulary, and mainstream life. Colleges and Universities are in a unique position to integrate sustainability into the behaviors and thoughts of the people of the world. Cornell College should embrace the challenge of sustainability as another way to set itself as an extraordinary and forward-thinking leader among liberal arts colleges.

Although actions which support sustainability can be taken in any realm of human society, institutions of higher education are, for many reasons, poised as ideal venues for fully integrating sustainability into community life. To better prepare future leaders (i.e. students) to work creatively toward a more sustainable society, colleges and universities need to take the initiative and lead by example. Also, because colleges and universities are typically long-lived, they should be particularly concerned with the long-term health of themselves and their communities.

Sustainability at Cornell

Cornell is not an environmentally-focused school, but neither is sustainability a purely “environmental” concept. In fact, the basic framework for making a commitment to sustainability is already present at Cornell College. While it is not stated explicitly at present, sustainability is an easy continuation of the college mission statement, as well as the 5 points of pride and strategic goals. Cornell has many other assets, too, which will be able to enhance and facilitate the initiation of a sustainability program. These include small size; present interests of faculty, staff, and students; timing; and a history of making rapid and significant wholesale changes to the institution (e.g., the establishment of OCAAT)

An environmental audit of Cornell College was conducted to evaluate the college’s current status in the context of sustainability. The results are used to erect a plan for making Cornell College more sustainable. In addition, several opportunities for continued student-directed projects are provided.

- **Buildings and Grounds**
 - *Strengths:* Many native plants are cultivated on campus. The several building projects planned for the near future provide opportunities to implement green building techniques.
 - *Opportunity for Improvement:* Implement green building techniques, such as those presented by the US Green Building Council.
- **Dining Service**
 - *Strength:* Vegetarian and vegan options are available at every meal in the dining hall.
 - *Opportunities for Improvement:* Purchase local food, when possible. Compost food waste.
- **Energy**
 - *Strengths:* President Garner signed the Presidents Climate Commitment in March of 2007, pledging to reduce the campus' net CO₂ emissions. A transition is underway to replace incandescent bulbs with fluorescent bulbs in all campus lights.
 - *Opportunity for Improvement:* Implement the Climate Commitment.
- **Purchasing**
 - *Strengths:* Many college departments use paper with 30% post consumer content. The majority of college-owned computers have flat-screen monitors.
 - *Opportunity for improvement:* Create and implement an Environmentally Preferable Purchasing Policy.
- **Transportation**
 - *Strength:* With a small, residential campus, very few students commute to class. Roads and parking lots are on the campus extremities and so do not dominate the campus.
 - *Opportunities for improvement:* Implement programs to reduce driving (incentives, car/ride sharing, public transportation, etc). Incorporate high-efficiency or alternative-fuel vehicles into the campus fleet.
- **Waste**
 - *Strengths:* A recycling program is run through work-study during the academic year. Lawn waste is composted.
 - *Opportunity for improvement:* Enhance and extend the recycling program. Implement a waste-reduction campaign.
- **Water**
 - *Strengths:* Most dormitories have low-flow showerheads and faucets. Irrigation is done on an as-needed basis.
 - *Opportunities for improvement:* Implement a water conservation program. Use rainwater harvesting techniques for irrigation.
- **Structure and opportunities**
 - *Strengths:* The Environmental Studies Program offers both a major and a minor. Several student groups address sustainability-related themes.
 - *Opportunities for improvement:* Write a formal sustainability mission statement and incorporate sustainability into the Strategic Plan. Hire a sustainability coordinator. Form a sustainability advisory council.

Making Cornell More Sustainable

At Cornell College, one of the biggest hurdles to sustainability initiatives is that the costs to sustainability are often perceived as outweighing the benefits. However, sustainability need not be a purely additional expense. Many sustainability initiatives, especially those which focus on waste reduction, will be able to save the college money which can subsequently be allocated to cover elements of the sustainability initiative which cost money to implement. Sustainability programs at numerous colleges and universities have documented substantial cost savings which have more than compensated for the cost of the programs. A visible and comprehensive sustainability program can also be an indirect source of revenue as it may attract potential donors and prospective students.

Perhaps the most critical aspect of successful sustainability programs is having active participation in all realms of the university with a “simultaneous top-down and bottom-up approach.” The sustainability initiative must include all offices, academic, administrative and managerial, and all levels of participants, including administration, faculty, staff and students. It must be clear to the college community that sustainability is not a concept that can be restricted to a particular issue or audience; it is applicable to absolutely every procedure, every policy, every action, and hinges upon the consistent participation of every individual.

A second critical aspect of successful programs is an organizational structure which can take a direct leadership role within the institution. The majority of successful sustainability programs at other institutions have full-time, permanent staff positions and an advisory council. To be effective, these positions must not only exist, but must have high degrees of institutional authority. Ideally the coordinator will report directly to the president and will chair the committee which is made up of faculty, staff and students. Creating a full time staff position and a committee should be top priorities at Cornell.

The words “sustainability,” “environmental” and “green” are controversial, but the actual components of them, such as maximizing resource efficiency, conservation of resources, and acting with consideration for the future, are not. Consequently, a successful sustainability initiative must focus on the meaning of sustainability rather than basing the effort on the word itself. Environmentally-themed colleges could frame a sustainability movement solely on environmental grounds. A college such as Cornell, however, which has a wider range of students, should tailor its sustainability campaign to reach that mainstream audience.

The term sustainability is one which can be defined and utilized in a productive manner. However, Cornell’s movement should be centered not on the word sustainability, but on the concept of sustainability. Doing so would create a movement which is radically different from that of most other institutions. Sustainability tends to be used as a unifying theme; and it is. But the unifying aspects of the concept can too often be counteracted by the divisiveness of the word itself.

In planning a sustainability movement, lessons can be learned from green marketing campaigns. Perhaps the most pertinent lesson for Cornell College is to avoid relying on educational campaigns. The campus setting facilitates the dissemination of information and education should certainly be a component of a sustainability campaign, but it should not be the only method used to generate change and spread ideas.

In any setting, changing behavior is not an easy task, and the negative perception of many people to sustainability may make it even more difficult. However, if the behaviors are not seen as “environmental” and are framed with the barriers removed so that the desired behavior is also the

“laziest” behavior, widespread behavioral change can occur even without equally-widespread philosophical change. At Cornell, a sustainability campaign can begin during New Student Orientation, to instill sustainable behaviors, and use positive incentives whenever possible.

The Sustainable Universities Initiative of South Carolina says “*we will have succeeded if we eventually don’t need a program to teach sustainability. It will be so ingrained in our behaviors, curriculum, and operations that we don’t have to think about how to be sustainable—we will simply do what is right as a matter of course.*” This is the ultimate goal of all sustainability campaigns.

Cornell has a history of rapid institutional change; if OCAAT can transform an overlooked Midwest institution into a “college that changes lives,” just think of the possibilities with an equally unique Cornell-style sustainability campaign. Cornell is in the position where it can decide to be bold and adopt the concept of sustainability as the central tenet of a campaign to unify the campus, save money and resources, and truly create community of caretakers who are committed to sustaining Cornell and the world not only for the present and for the next five years, but for many generations to come.

Introduction

“Our vision is of a life sustaining Earth. We are committed to achievement of a dignified, peaceful, and equitable existence...Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends.”

President's Council on Sustainable Development

“Sustainability is more a direction than a destination, it is a process of continually improving the way we live in order to respect the reality of limits, whether those limits are imposed by nature or embraced voluntarily by people living together in cooperation and democracy”

Sustainable Seattle,” Indicators of a Sustainable Community”

Sustainable is an adjective which should describe every academic institution, but currently describes none to a full extent, and Cornell scarcely at all. The purpose of this project is to provide a catalyst for making Cornell College a sustainable campus. This thesis is divided into 5 sections: 1), an introduction which defines sustainability and explains the relationship between sustainability and institutes of higher education; 2) an evaluation of Cornell College's assets in regard to sustainability; 3) a presentation of the results of the Cornell Environmental Audit; 4) an outline of strategies which Cornell could use to become more sustainable; 5) a summary of goals for Cornell. This document will be a useful reference for the College as it begins the process of initiating a detailed sustainability plan. Instituting a comprehensive sustainability campaign should be a top priority for Cornell College because, if the campaign is framed correctly, it will lessen the college's social and environmental impacts but and enhance its image as a truly extraordinary institution.

What is sustainability?

Today, with liberals and conservatives alike in general agreement that environmental crises are looming in the not-so-distant future, sustainability can be a unifying concept for people with a wide range of political leanings and degrees of affinity for the natural environment. From one perspective, sustainability is a way for humans to lessen their impact on the environment, to mitigate or even begin to reverse some of the damage so that habitat degradation and species extinction may begin to slow. From another perspective, sustainability is a way for human organizations, including households, cities, businesses or educational institutions, to save money and function more efficiently now and in the future.

It is no coincidence that the two ends are addressed simultaneously. Historically, human development has proceeded under the inaccurate assumptions that earth's resources are infinite, earth's capacity for retaining waste is infinite, and human society is so complex that the actions of one individual person or organization cannot possibly make a significant impact (Harvard 2002). The reality is that resources and waste receptacles are not infinite and the only way to sustain any sort of long-term human existence on this finite earth is through the cumulative positive impacts of individual efforts.

Although rooted in traditional philosophy such as Native American lore and Leopold's Land Ethic, the word *sustainability* as a catch-phrase did not truly enter global vocabulary until the 1980s. In 1987, the United Nation's World Commission on Environment and Development released a report titled “Our Common Future.” This report emphasizes the integral connection between economic development and ecological health. The report's definition of sustainability, which is probably the one cited most frequently, is: “*meeting the needs of the present without compromising the ability of future generations to meet their own needs*” (United Nations 1987). The focal point of this definition is “needs.” From a human standpoint, needs, or necessities for survival, include food, clean water, and shelter, as well as the modern societal extensions of health care, education, and technology. Because this definition does not restrict itself to sustaining human needs, it can readily be extended to include needs of the global biosphere as a whole. Of course, the main point of the UN report is that human needs are met through

the use of natural resources and processes, so the sustained health of the biosphere is requisite for human sustenance.

The report outlines five key concepts of sustainability which should be addressed at a global level:

Principles of Sustainability ***Our Common Future***

- The needs of the *future must not be sacrificed* for the demands of the present.
- Humanity's economic future is linked to the *integrity of natural systems*.
- The present *world system is not sustainable* because it is not meeting the needs of many, especially the poor.
- Protecting the environment is impossible unless we *improve the economic prospects* of the Earth's poorest people.
- We must act to *preserve as many options as possible* for future generations, since they have the right to determine their own needs for themselves.

In response to the catastrophic Exxon Valdez oil spill, in 1989, the Coalition for Environmentally Responsible Economics drafted a set of broad standards to provide corporations with an outline to follow for making environmentally sustainable decisions and policies. The standards, known as the Ceres Principles, can be endorsed by corporations, a process which formalizes the company's support of sustainability and commits the business to changing its operations. More than 50 companies have endorsed the Ceres Principles, including 13 Fortune 500 firms, the first of which was Sunoco, in 1993.

Ceres Principles

- *Protection of the Biosphere*
Make continual progress toward eliminating the release of any substance that may cause environmental damage and safeguard all habitats affected by our operations.
- *Sustainable use of Natural Resources*
Make sustainable use of renewable natural resources and conserve non-renewable resources through efficient use and careful planning.
- *Reduction and Disposal of Wastes*
Reduce and where possible eliminate waste through source reduction and recycling.
- *Energy Conservation*
Conserve energy and improve efficiency of operations and make every effort to use environmentally safe and sustainable energy sources.
- *Risk Reduction*
Minimize environmental, health, and safety risks.
- *Safe Products and Services*
Reduce and where possible eliminate the use of products and services that cause environmental damage or health or safety hazards.
- *Environmental Restoration*
Promptly and responsibly correct conditions we have caused that endanger health, safety or the environment.
- *Informing the Public*
Inform in a timely manner everyone who may be affected by conditions that endanger health, safety, or the environment.
- *Management Commitment*
Implement these principles and sustain a process that ensures that the management/administration are fully informed about pertinent environmental issues and are fully responsible for environmental policy.
- *Audits and Reports*
Conduct an annual self-evaluation of our progress in implementing these principles.

Another set of sustainability principles was published by Pennsylvania State University in their 2000 *Penn State Indicators Report*, a document created by the Penn State Green Destiny Council. This report stresses that, although sustainability as a critical societal goal is a relatively new concept, the basic ideas behind sustainability are congruent with widely held ethical ideals, such as frugality, honesty and democracy. The assertion is that, although members of consumption-based societies generally agree with these ideals, their actions are contradictory, as they are based upon characteristics generally viewed as negative, such as greed, concealment, and rivalry. The Penn State report includes the following table that compares the ethics of a sustainability based culture and a consumption based culture, in regard to their stated principles of sustainability:

PRINCIPLE	SUSTAINABILITY-BASED CULTURE	CONSUMPTION-BASED CULTURE
<i>Respect Life</i>	Humans understand themselves as embedded in and interconnected with the Earth's ecosystems.	Humans understand themselves as manipulators of life; the earth is generally regarded as a resource pool to be exploited.
<i>Live within Limits</i>	There ARE limits to growth and consumption; resource supplies are finite.	There are NO limits to growth and consumption; resource supplies are infinite.
<i>Value the Local</i>	Emphasis on the local economy, face-to-face interaction, and community identity.	Emphasis on the global economy and mass culture.
<i>Account for Full Costs</i>	Decisions are based on full-cost accounting; concern for future generations.	Decisions based primarily on narrow economics; concern for present generation only.
<i>Share Power</i>	Power and wealth are shared; Citizenry empowered and influential.	Power and wealth are concentrated; citizenry passive and without significant influence.

What is Campus Sustainability?

Actions which support sustainability can be taken in any realm of human society including business, agriculture, and individual households. However, in the words of the International Institute for Sustainable Development, “*the campus itself is an ideal test bed for new approaches and ways of thinking and living that are supportive of sustainability*” (<http://www.iisd.org/educate>). In publications by their Green Campus Initiative (2002), Harvard also maintains that campuses are ideal settings for exploring sustainability innovations both because they have large pools of potential researchers, in the form of faculty members and students, and because their focus on education enables them to have a wide-spread and long-lasting impact. David Orr, chairman of the Oberlin College program for Environmental Studies, specifically calls attention to the possibilities of colleges promoting environmental literacy with the statement that “all education is environmental education” (Orr 1992).

A college or university community is relatively contained and all community members, from the president to the students, significantly and directly contribute to the way the community functions and uses resources. Consequently, the process of making changes toward sustainability at the college level can be fairly straightforward, at least more so than in other settings. For instance, it would be difficult for a city government to mandate that every home use fluorescent lights exclusively, but it feasible for a college to place fluorescent lights in every dorm room. Likewise, and perhaps most critically, all college and university operations are carried out under the direction of a mission statement, hence the institutional framework can facilitate the incorporation of over-arching goals, such as sustainability, into all aspects of the college.

Campus sustainability campaigns can take many forms, from simple sets of projects to comprehensive institutional commitments. Ideally, project-oriented and policy-oriented campaigns should coincide at the same institution, the former to instigate concrete changes and the latter to ensure that the trend will persist. A general definition of a sustainable university is given by Penn State, in their *Indicators*

Report (2000), which describes such a university as one whose prospect for longevity is good because its core values and actions coordinate to ensure that its negative impacts on the planet are minimal.

Similarly, the book *Greening the Ivory Tower* (Creighton 1998) portrays the “green university of the future” as one which “*may use resources efficiently, create little or no waste, and take full responsibility for any waste it does generate. It recognizes that it has responsibility to lead rather than follow, to find new solutions to old problems and to continuously improve its business of environmental protection.*”

David Orr, in his 1991 paper “Rating Colleges,” takes the ideal sustainable university model and applies it to current institutions by outlining a new system of ranking colleges. This system is based upon “whether the institution and its graduates move the world in a more sustainable direction or not.” Orr shows how this system can rate institutions based upon five criteria:

A New Ranking System for Colleges and Universities

- *What quantity of material goods does the university consume on a per capita basis? (e.g., How much paper and water are used per student? How much CO₂ is released per student for electricity and heating needs?)*
- *What are the university/college management policies for materials, waste, recycling, purchasing, landscaping, energy use, and building? (e.g., Is there a priority to use recycled materials? Is the use of toxic chemicals kept to a minimum?)*
- *Does the curriculum engender ecological literacy? (e.g., Do graduates know the “stories” behind their food, water, and discarded materials? Are there opportunities to restore local rivers and degraded lands?)*
- *Do university/college finances help build sustainable regional economies? (e.g., Do food purchases come from regional farms? Are endowment funds invested in enterprises that employ sustainable practices and produce goods that truly benefit society?)*
- *What do the graduates do in the world? (e.g., Do the lives they lead contribute to a sustainable culture?)*

The Talloires Declaration further applies the sustainable university concept to actual institutions through the use of a ten-point action plan for campus sustainability, similar to the Ceres principles for corporations. The declaration was written in 1990 at an international conference of 22 university presidents and chancellors, led by the President of Tufts University, and held for the specific purpose of addressing the need to confront issues regarding sustainability at the university level. The declaration has been signed by over 300 schools in over 40 countries and has also served as a template for other official university declarations, including the 1991 Halifax Action Plan for Universities, the 1993 Copernicus University Charter for Sustainable Development, and the 1995 Student Charter for a Sustainable Future.

Talloires Declaration: Points of Action

- *Increase Awareness of Environmentally Sustainable Development*
Use every opportunity to raise public, government, industry, foundation, and university awareness by addressing the urgent need to move toward an environmentally sustainable future.
- *Create an Institutional Culture of Sustainability*
Encourage all universities to engage in education, research, policy formation, and information exchange to move toward global sustainability.
- *Educate for Environmentally Responsible Citizenship*
Establish programs so that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.
- *Foster Environmental Literacy for All*
Create programs to develop the capability of university faculty to teach environmental literacy to all students.

- *Practice Institutional Ecology*
Establish institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- *Involve all Stakeholders*
Expand work with community, government, and nongovernmental organizations to assist in finding solutions to environmental problems.
- *Collaborate for Interdisciplinary Approaches*
Develop the capacity for interdisciplinary teaching about population, environment and sustainable development.
- *Enhance Capacity of Primary and Secondary Schools*
Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about sustainable development.
- *Broaden Service and Outreach Nationally and Internationally*
Work with national and international organizations to promote a worldwide university effort toward a sustainable future.
- *Maintain the Movement*
Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

The international push for sustainability in education has continued and, in 2002, the United Nations General Assembly declared that the decade beginning January 1, 2005 would be the Decade of Education for Sustainable Development. One goal of the International Implementation Scheme is the “*reorienting of existing education policies and programs to address the social, environmental and economic knowledge, skills and values inherent to sustainability in a holistic and interdisciplinary manner.*” The vision of the US Partnership is to make “*sustainable development fully integrated into education and learning in the United States*” so that “*literacy about our sustainability challenges and engagement in solutions (is a) societal norm in the U.S*” (UN 2002).

Why is Campus Sustainability Important?

A common analogy used for talking about campus sustainability is that Colleges and universities are equivalent to miniature cities. Colleges, like cities, have populations of administrators, employees, and citizens (students); have a system of government that sets policies and procedures and maintains a network of buildings, grounds, roads, and parking lots; operate by consuming innumerable products, from electricity and natural gas to food and pesticides, and generate many forms of waste, from CO₂ and sewage to hazardous chemicals and trash. Although colleges and universities are located within larger “true” cities or towns, they are commonly the largest consumers of resources and producers of waste in their immediate areas. Because colleges and universities inevitably make such a large impact on their local community, they have a special responsibility to concentrate on making that impact as small as possible.

Within a broader perspective, Harvard University (2002) describes campus sustainability as the required response to the present “environmental imperative.” The contention is that responding to this imperative is critical for the continued survival of institutes of higher education. Because colleges and universities are typically long-lived, they should be particularly concerned with their impacts on the long-term health of their community. A second critical feature of the university response to the environmental imperative is that the future world leaders are in college today, yet, by example, most colleges and universities are telling them that sustainability is not an important issue. To better prepare future leaders to work creatively toward a more sustainable society, colleges and universities need to take the initiative and lead by example.

In a similar vein, the *Chronicle of Higher Education* Special Report on sustainability (2006) includes an interview with author and social critic James Kunstler. During the interview, Kunstler warns that

colleges and universities, many with sprawling campuses which are suited more to cars than to pedestrians and with class activities or assignments which require inordinate consumption of paper and chemicals, are currently based in an affluent consumer society. He asserts that this society is going to collapse, but that universities are doing next to nothing to prepare themselves and their students for this drastic and inevitable change. He also differentiates between sustainability efforts that are aimed at maintaining the status quo, versus those that actually address the problem itself by involving large-scale changes in the way the university and the people within it function.

Even apart from directly environmental reasons, sustainable practices are frequently valuable to colleges and universities from a strictly economic perspective. Opportunities to reduce waste can be viewed as opportunities to save both resources and money. It is true that many sustainability practices, such as switching to energy-efficient lighting and heating systems or installing an onsite composting facility, require significant upfront costs. However, these actions should be viewed not as expenditures but as investments; after a particular payback period, these new sustainable practices actually save the institution money.

From the institutional standpoint, a commitment to sustainability has several beneficial “side effects.” Sustainability initiatives can be valuable educational venues, as truly useful research can be incorporated into student projects. Efforts to become more sustainable are also often highly popular with alumni and prospective students and may actually attract donations and incoming freshmen or transfer students.

Clearly, sustainability is in the best interest of every college and university. Cornell College is an institution which has not yet begun a large-scale sustainability initiative. Beginning such an initiative will require much thought and coordinated efforts from all members of the college community. By providing information about the many facets of sustainability, outlining an action plan and giving insights into how a sustainability movement should be framed, this report can act as a springboard from which Cornell can take off in the direction of sustainability.

Sustainability Framework at Cornell College

The basic framework for making a commitment to sustainability is already present at Cornell College. Cornell’s positive attributes include: strong institutional values, as outlined in the Strategic Goals and Five Points of Pride; local values; small size and current community interest; fortuitous timing; and a history of large-scale transformation (e.g. OCAAT). Each of these resources will aid Cornell as it begins its sustainability campaign.

Institutional Values

Cornell’s mission statement declares that the goal of the college is “*empowering students for leadership through productive careers and humane service in the global community.*” While it is not stated explicitly at present, sustainability is an easy continuation of this mission because leadership and service with a global perspective are inherent to sustainability.

Sustainability is also congruent with Cornell’s Strategic Goals and Five Points of Pride:

Sustainability and Cornell’s Strategic Goals

- ***Create Extraordinary Academic Experiences***

Sustainability lends itself to projects which will engage students in cross-disciplinary research projects with result which will be directly applicable to campus decisions, so students will be able to connect the “real world” to their academic experiences.

- *Create Extraordinary Co-Curricular Experiences*
A comprehensive sustainability campaign can connect all aspects of the college experience, including student organizations, Residence Life, and internship possibilities, among others, thus creating numerous opportunities for student leadership and creating a sense of campus unity.
- *Stabilize enrollment at 1200 students*
Like OCAAT, a uniquely-framed sustainability initiative can set Cornell apart and attract high-quality, innovative, forward-thinking students.
- *Provide a stable and adequate financial base for the College*
Sustainability initiatives will likely appeal to many potential donors, as well as make Cornell eligible for certain grant monies. Many of the initiatives will also enable Cornell to save money through reduced consumption and waste removal fees.
- *Enhance the physical plant of the college*
The enhancement of facilities is an opportunity to demonstrate principles of sustainability in action and to experience the benefits of the newly implemented sustainable technologies and practices.

Sustainability and Cornell's Points of Pride

- *Excellence in the Liberal Arts*
Because it is applicable to all courses of study and all future careers, sustainability is an interdisciplinary topic which shows the liberal arts "in action."
- *Emphasis on Leadership and Service*
Working for sustainability is an act of service, to both global and local communities. Because sustainability is not yet a societal norm, making a commitment to sustainability puts an individual person or institution into a leadership position.
- *Ideal Campus Setting*
Sustainability shows a commitment to preserving and enhancing the beauty and ecological integrity of the campus.
- *Residential Community*
Sustainability is a way to foster community connections, attract positive press and show commitment to community values.
- *One-Course-At-A-Time*
The block plan allows for numerous independent studies or internships for students to work directly with campus sustainability issues.

Social Values

In addition to its institutional values, the Cornell community is inevitably influenced by its location in Iowa, a state which prides itself on having strong Midwestern values. In a hand-out which she created for the Rocky Mountain Sustainability Summit, Dr. Claudia Hemphill Pine of the University of Idaho described sustainability initiatives in terms of social assets which are present in many communities. These assets included self-sufficiency, care for children's future, thriftiness, place attachment, sense of community, and many others which are part of Iowa communities. Within this framework of traditional values, sustainability does not have to be viewed as radical or exclusively leftist, but a natural continuation of a recognizable and long-held system of moral values.

Community Size and Interest

The small size of the Cornell community can help facilitate the rapid integration of sustainability into the college. Larger universities, such as the University of South Carolina, have had difficulty unifying the institution into a single campaign (personal communication). Without unification, separate isolated initiatives tend to develop, such as the green West Quad and School of Public Health at USC which were products of separate forces. Because Cornell has a comparatively simple administrative structure, with one point of contact each for operations, academics and campus life, simultaneous and integrated initiatives will be easier to coordinate and oversee.

Interest in and personal commitment to sustainability was gauged for this report and was found to be already present in many of Cornell's community members. In the faculty and staff survey (Appendix 1), 77% of respondents indicated that it was important or very important to them that Cornell become more sustainable; this is a sharp contrast to the 5% who said it was unimportant or very unimportant (Appendix 1 figure 1). When asked which reason for sustainability, in general, was most important to them, 48% of faculty and staff chose "saves resources," 33% chose "right thing to do," 9% chose "saves money" and 10% chose "other" (Appendix 1 figure 2). These responses are positive and suggest that Cornell's faculty and staff will be a valuable and willing resource for institutionalizing sustainability on campus.

Similarly, of the student participants in the Residence Life survey, 51% indicated that they were either interested or very interested in learning about sustainability, while only 14% said they were uninterested or very uninterested (Appendix 1 figure 3). This, too, is positive and indicates that there will be at least some student support of a sustainability campaign.

Additionally, a number of student organizations exist which relate to some aspect of sustainability or environmental issues. If these organizations were unified, a strong student coalition with direct and indirect interests in sustainability would be formed easily. Even if the number of active members in these organizations is small, the email lists are typically quite large. Low-levels of participation in groups may be a symptom of the busy block plan calendar, but it does indicate that the number of students interested in sustainability issues is much greater than the number which are actively engaged in them at this time. If some sustainability-related initiatives were framed as service opportunities, the number of interested and willing student participants would probably increase dramatically. For example, the members of the Greek system could be strong contributors to sustainability-related service projects, especially because the number of service hours required per active member was increased recently.

Timing

The most successful movements of any sort are able to draw from the fortuitous combination of many unrelated events. At Cornell, the concurrence of several unrelated phenomena makes the timing ideal for the initiation of a unified commitment to sustainability. Most notably, when President Garner signed the Presidents Climate Commitment in March, 2007, he made the College's first institutional commitment to sustainability. This decision, and the strategic action plan which will be created because of it, can be used as a foundation for a more comprehensive initiative.

The current set of Strategic Goals has detailed objectives through 2009. Since they will need to be re-assessed at that time, an opportunity for incorporating sustainability into the strategic goals of the college will become available. Similarly, the requirements for the BA degree are currently undergoing a reconfiguration and this could be an opportunity to integrate sustainability into the curriculum. There are also several new buildings and renovations planned for the near future; these could be opportunities to begin employing green building practices, as is suggested in the Climate Commitment.

Coincidentally, 2008 marks the 30th year of OCAAT and the 50th reunion of the class of 1958, which is planning their class gift to be an enhancement to the Environmental Studies program. These two events set fall of 2008 as an appropriate time to kickoff a sustainability initiative in conjunction with celebrating OCAAT and the class gift.

Finally, a recent *Cornellian* article titled "what, if anything, can unify the Hilltop?" addressed Cornell's need of enhanced school spirit. Dean of Students, Karla Carney was quoted in the article as saying "we should focus our energy on what it means to be a Cornellian broadly—traditions, rituals, common

experiences, and an overall sense of connectedness.” Properly framed, a sustainability initiative could be a just the sort of unifying campaign which helps to boost school spirit and community involvement.

History of “Risk-taking”

Although the basic foundation for a sustainability initiative is already present in the central tenets of Cornell and the college has many assets which will assist in sustainability efforts, making a thorough commitment to sustainability will require a paradigm shift—something that is inherently risky. However, Cornell has a history of making radical paradigm shifts. In 1978, Cornell faculty members voted to depart from the traditional academic semester calendar and adopt the One-Course-At-A-Time block format. This move was virtually unprecedented, with Colorado College as the primary guide, and was definitely risky. Despite the risks, the Cornell community saw the decision as an opportunity to completely alter the educational paradigm of college—for the better. This historic decision-making process took place in approximately two years, from conception to initiation; an incredibly rapid pace for such a significant change (Milhauser 2003).

The complete integration of sustainability into Cornell College operations, academics and community life is a similar opportunity. Properly framed, a comprehensive sustainability campaign will, like OCAAT, set Cornell apart as a visionary leader, spearheading a movement for a new institutional paradigm. The history of OCAAT proves that it is possible for rapid and radical change to occur at Cornell College. As with OCAAT, a uniquely-framed sustainability movement will generate publicity and interest from prospective students, helping to further Cornell’s reputation as an institution which provides an educational experience that is both excellent and unlike that found anywhere else.

Cornell Environmental Audit

Indicators of Sustainability

Before Cornell College can become more sustainable, there must be a way to evaluate how sustainable it is at this time. Although there is no universal consensus on how to measure sustainability, research is underway to determine exactly what factors are most useful for evaluating environmental impact. At present, many independently constructed systems for measuring sustainability have been drafted and applied to particular settings, such as cities and universities.

A common metric of sustainability, both to document current status and to evaluate progress, is through a system of indicators. An individual indicator is typically a highly specific category of information, such as the amount of food waste per capita generated in university cafeterias. Together, a set of indicators gives a comprehensive picture of the whole system. Indicators can be highly general, or can be specific to particular settings. The *Sustainable Seattle* report (1998) of the city of Seattle describes certain characteristics that must be met for indicators to be useful measures of sustainability (the criteria for effective indicators are in Appendix 2).

Similar to the indicators Seattle drafted for urban communities, the Association of University Leaders for a Sustainable Future has drafted seven general indicators of sustainability for institutes of higher education:

Indicators of Sustainability

The Association of University Leaders for a Sustainable Future

- *Curriculum*
All departments offer courses with topics relating to sustainability.
- *Research and Scholarship*
Interdisciplinary research programs exist to investigate practices relating to sustainability.
- *Operations*
Practices such as energy conservation and waste reduction are integrated into facilities as well as education and research.
- *Faculty and Staff Development and Rewards*
Hiring, tenure and promotion recognize contributions to sustainability; development programs exist to increase awareness and environmental literacy.
- *Community Service and Outreach*
Have projects to support sustainable local communities, partnerships with schools, businesses, government and other institutions.
- *Student Opportunities*
Orientation and opportunities for student involvement and exposure to environmental careers.
- *Institutional Mission, Structure and Planning*
Formal written statements with commitment to sustainability, positions, committees, etc for sustainability, environmental issues with broad campus visibility.

While indicators provide a means for sustainability to be measured, they do not provide any information without the appropriate data. An environmental audit is a tool used to gather data so that the overall environmental impact, or “ecological footprint,” of an institution can be quantified. Information gathered by audits and applied to indicators can be useful for creating a pool of baseline data about current institutional operations and for prioritizing specific areas in which changes are to be made. The primary questions an environmental audit attempts to answer are how things are currently done and why, where waste occurs, and how waste can be reduced. Waste, in this context, is any resource (e.g. electricity to light an empty room, heat which escapes through a drafty window, or food that is thrown out rather than eaten) that is removed from the system unused. An audit looks both at the impacts which are immediate and tangible, and at those which are more widespread and have long-range influence. Audits also outline opportunities to reduce the noted impacts. Comprehensive audits can be extremely labor intensive, but detailed audits on particular problems can be very useful for informing decisions and determining progress once decisions have been made. Carrying out an environmental audit is typically one of the first steps a college or university takes in the process of becoming more sustainable. The results of an initial environmental audit of Cornell College are presented below.

The Environmental Audit

In order to evaluate Cornell’s current status in regard to sustainability, and to best make recommendations on how Cornell could become more sustainable, a basic environmental audit was conducted. Categories included in the audit are: Buildings and Grounds, Dining Services, Energy, Purchasing, Transportation, Waste, Water, and Structure and Opportunities. The section for each category includes background information, a description of current operations at Cornell, and opportunities for changes that Cornell could make to become more sustainable. Case studies of how other academic institutions have addressed each category are included in Appendix 3.

Because this is the first time that a synthesis of this sort has been attempted at Cornell, this report provides descriptions of how operations work at Cornell more often than actual data. In the future, audits should be conducted regularly so that long-term trends can be observed. For these regular audits, the people who are involved with each category should be guided by the Sustainable Seattle Indicator Criteria (Appendix 2) to ensure that the data reported will be of the most use to the college. Also, other

institutions have found it important to create the right campus attitude about the audit process so that no individual feels the need to “cover up” information. Instead, the audit process should be looked upon as one which helps reveal opportunities for the college to make positive improvements which will have environmental and economic benefits. Questions used for the audit are included in Appendix 4.

A. Buildings and Grounds

A campus landscape, composed of both the grounds and the buildings has multiple roles and affects the entire campus community. Buildings and grounds can be viewed from a purely utilitarian perspective focusing on the processes of water flow and runoff, pedestrian flow, building functions, etc. At the same time, the saying “don’t judge a book by its cover,” could easily be rephrased to say “don’t judge a place by its appearance,” but, of course, people do, in both situations. Because a college’s buildings and grounds are what people see—the people who live and work there and also potential donors and prospective students—the physical campus contributes to the way people feel about the institution. This power to affect people’s impressions can also be used intentionally by allowing the external appearance to reflect the values and priorities of the institution and its community.

While buildings and grounds create both the functional flow and the external ambiance of a college, they also play a hugely significant role in the social and ecological impact of the institution. According to the United States Green Building Council (www.usgbc.org), the foremost authority on sustainable building, US buildings account for 36% of total annual U.S. energy use, 65% of electricity consumption, 30% of greenhouse gas emissions, 30% of raw material use, 30% of waste output (136 million tons annually) and 12% of potable water consumption.

However, it is possible for an institution to make a commitment to lessening the impact of its buildings and grounds by changing to green practices. These practices can be implemented by taking sustainability into consideration with new buildings or campus development plans and by integrating green features into existing buildings. As described by the US Green Building Council’s LEED (Leadership in Energy and Environmental Design) Green Building Rating System (in which buildings with certain levels of green characteristics may be deemed “certified,” “silver,” “gold,” or “platinum”) green building emphasizes high performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. These goals can be achieved through a variety of different ways involving a combination of practices, products, and technologies. While green building technologies can be expensive, especially when retrofitting existing buildings, the energy savings created by the higher levels of efficiency typically have reasonable payback periods which compensate for the added initial cost. The challenge is in looking at long-term rather than up-front costs (see case studies in Appendix 3 for examples).

Sustainable landscaping practices can similarly be both environmentally and economically favorable. One form of sustainable landscaping is xeriscaping, a technique which carefully selects plants to reduce water and maintenance demands. If a differentiation is made between portions of the landscape that require heavy grooming, such as athletic fields and flower gardens, and those which do not, such as campus open space, opportunities for implementing sustainable practices can open up. Campuses, then, can be viewed as a living portion of the classroom and can be managed to promote biodiversity, especially of native species, limit the spread of invasive and nonnative species, limit water runoff, and sequester carbon.

i) What Happens at Cornell?

Cornell owns 129 acres, for which there is a general long-range development plan describing existing and future land uses. The document contains a limited amount of environmental criteria. The main campus includes 42 buildings and the entire campus is on the National Register of Historic Places.

Phase I of Cornell's recently-completed Master Plan includes building a new residence hall (to open fall 2007), expanding and renovating the Commons, expanding and renovating West Science, and renovating the library and King Chapel. Separate committees have been or will be formed for each project, and environmental considerations will be addressed on a case-by-case basis. In the survey completed for this report, over 75% of faculty and staff stated that instituting green building practices at Cornell was either important or very important (Appendix 1 figure 4).

Currently, a small prairie restoration effort, headed by Professor Andy McCollum, is in place near the soccer field, many native trees are planted on campus, and Katrina Garner uses native vegetation in her gardens and landscaping. Cornell also has a Memorial Tree program in which groups or individuals may donate money to the college and select a tree to be planted on campus. For this program, all trees selected by the donors must be native to Iowa. However, many non-native ornamental trees have also been planted on campus in recent years. A new organization, the Cornell Operation First Impressions Club, was just formed. This group will consider opportunities for native landscaping in the near future. A manufactured blend of fertilizer is used on campus, in quantities of around 5,000 lbs/yr, namely on the athletic fields and areas which need to be reseeded.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Establish a campus policy to maximize **LEED certification** or standards on all future building and renovation projects.
- Establish a campus policy to utilize **an Integrated Pest Management** system.
- Install resource **monitoring devices** in new (or even existing) dorms so that students can track their resource consumption.
- Establish a campus policy to use **xeriscaping** techniques and/or **native plants** in all future landscaping endeavors.
- Initiate in-depth **efficiency audits** of campus buildings (especially dorms) to determine key areas (windows, doors, etc) where efficiency could be maximized.

Short-term Goals:

- Provide **opportunities** for appropriate Cornell staff members to become educated on green building and xeriscaping techniques.
- Cornell Operation First Impressions Club could install **plant species labels** in high-profile areas to highlight native landscaping efforts.
- Transform **Ink Pond** into a wetland by planting it with cattails and other local emergent plants.
 - Turning the pond into a wetland would eliminate the current algae problem and would increase the pond's potential as wildlife habitat, especially for birds such as Red-wing Blackbirds.

B. Dining Services

The ways in which food is cultivated, distributed, consumed and disposed of have significant environmental and social impacts, which can be categorized as direct or indirect. Indirect impacts include the effects of agricultural production, and the processing and transportation of food products. Direct impacts are anything that the individual consumer has direct control over, and include traveling to shops, cooking, and generating waste. The indirect impacts, however, are larger in scope because they are the results of the decisions made by the food industry at large. Consequently, there is little that individual consumers can do to address these impacts other than alter buying habits to put certain pressures on the food market. In contrast, direct impacts are smaller in scale (but still significant

because they represent the cumulative actions of individuals in the ways in which they shop for, prepare, and dispose of their food and food waste) and can be greatly altered through changes in individual behavior, especially in regard to waste reduction.

The large scale of a campus dining facility enlarges the typical scale of direct impacts and provides significant market influences on indirect impacts. Hence, institutional dining facilities can be instrumental in maintaining the status quo or in promoting change in the dining industry.

Sustainability initiatives in dining can be aimed at reducing both the indirect and direct impacts of the food industry. The primary way in which an institution, or an individual, can work to decrease the indirect impacts of the food they consume is to purchase locally-grown, organic products whenever possible. This is one action for which the direct cost may be higher than the direct cost of the non-sustainable alternatives. However, this is only because the indirect costs of, for instance, having fresh bananas in Iowa all year long, are not included in the market price. If the costs of the chemicals used to treat the bananas, the environmental degradation caused by their plantations, the cost of their shipping and the other external costs were included, bananas would likely be too expensive for all but the wealthiest of consumers to purchase.

The most effective way of reducing the direct environmental impact of food is by diverting it from the waste stream and allowing the material to biodegrade naturally. Composting, which can be done in a variety of ways, will typically have fairly high initial costs, especially for purchasing the appropriate equipment, but the process will save money by reducing land-fill charges and could even make money if the compost product were sold.

i) What Happens at Cornell?

Cornell's dining services, the Ratt and the cafeteria, are run through a contract service with Sodexo USA. On campus, there is a Food Committee which meets monthly. Sodexo does not directly purchase food from any local farmers, or any organic farms. However, some of Sodexo's suppliers, including Harkers, Loffredo, United Natural Foods, Anderson Erikson, and Sysco, do have regional provider programs and organic programs.

Vegetarian and limited vegan options are available at every meal and a limited amount of organic and vegan products, especially milk, yogurt and jam, are available in a dedicated refrigerator which all students can access within the cafeteria.

Sodexo policy for leftovers that do not meet their safety standards is to discard the food as waste into a landfill. The amount of discarded food is not measured, so the amount of wood waste generated at Cornell is unknown. Some food goods are donated to the local Food Bank and Salvation Army.

Multi-use ceramic bowls and plates, plastic cups, and metal utensils are used and washed in the main cafeteria. The Ratt also offers some items in multi-use containers, except that the take-out dishes are predominately styrofoam. Many of the single-use items in the Ratt and Scramble, however, are made with some recycled content. For example, Fort Howard, the largest supplier of napkins and paper towels for Sodexo uses 100% post-consumer recycled fibers. Mobil Chemical, the main supplier for plastic can liners uses 30% to 90% recycled material. Sweetheart Cup, Solo Cup, Amoco, Dart and Mobil use some post-consumer recycled materials in their foam and paper plates, bowls and carry-out containers.

Cornell had a recycled-mug program in which participants would get a small discount on beverages purchased at the Ratt if they used their own durable mug. Although this program has been discontinued, a similar one operates in Cole Library.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies about other academic institutions)

Long-term Goals:

- Consider **switching food service providers** from Sodexo USA to one which is more progressive, such as Bon Appetit Management Company.
- **Compost** all food waste.
 - Composting reduces the amount of waste which is landfilled, slowing the rate at which landfills exceed capacity and reducing the cost of waste disposal.
 - The resulting composted mulch could be used on campus grounds or sold to local farmers.
 - A joint-program could be implemented between Cornell and the City of Mount Vernon to compost waste generated in all dining facilities.
- Make a commitment to using **local and organic** food whenever feasible.
 - The indirect impact and external costs of the foods will be reduced by drastically reducing the distance the food travels and the impacts of the growing process.

Short-term Goals:

- Reduce the use of **single-use** food packaging, especially in the Ratt.
- Reinstate the **reusable mug** program and give drink discounts for customers who use their own mug.
- Serve **organic, shade-grown fair-trade coffee** in the Ratt and Scramble.
- Make all-campus **picnics** more sustainable by using biodegradable plates, cups, and plasticware and finding a local facility which will accept the one meal's worth of compostable material.
- Put up **signs** encouraging students to take only as much food as they plan on eating; it is an all-you-can-eat facility so they can always come back for more.

C. Energy

Energy use and the associated effects of climate change are hugely significant problems in the world today. Effects of climate change, such as irregular and violent weather events, loss of biodiversity, spread of disease, heat-waves, droughts, and famines are beginning to be felt and will only grow worse (IPCC 2007). The general scientific consensus is that global society must reduce greenhouse gas emissions by at least 80% no later than 2050 in order to avoid the worst consequences of global warming (UN Framework Convention on Climate Change). These facts, and the urgency with which they must be addressed, are being recognized by a growing number of colleges and universities.

The American Association of College and University Presidents Climate Commitment was born out of the need for higher education to unite and “exercise leadership in their communities and throughout society by modeling ways to eliminate global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality” (www.presidentsclimatecommitment.org/). The signatory presidents stand by the statement: “campuses that address the climate challenge by eliminating global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society” (www.presidentsclimatecommitment.org/).

The goal for each signatory institution is to become climate-neutral, that is, to have no net emissions of greenhouse gasses by reducing emissions as much as possible and compensating for the remaining emissions through the purchase of carbon offsets, planting trees, or other means. Climate neutrality is broader than simply having renewable electricity sources, and institutions are expected to include on-site fossil fuel combustion, electricity consumption, vehicle use by students, faculty and staff for college purposes (including commuting), institution-funded air travel, and other indirect sources such as the travel-distance of purchased materials and food in their impact assessments.

Colleges and universities must be leaders in the fight against climate change, and completely reassessing and revamping the ways in which campus energy is generated and consumed is critical. Progress can be made in two main areas. A shift must be made in the source of energy from fossil fuels, coal, and other traditional sources which are non-renewable and polluting, to clean, renewable sources. Just as importantly, behavioral habits and institutional structures must change to maximize efficiency and minimize consumption.

i) What Happens at Cornell?

President Garner has signed the Presidents Climate Commitment to attain institutional climate neutrality within a reasonable time period. With this decision, President Garner set in motion a process which will include setting up some sort of institutional framework (committee); completing an inventory of greenhouse gas emissions; creating and implementing a plan through which climate neutrality can be reached; integrating sustainability into the curriculum; and making information about the process available to the public.

This is a very exciting move for Cornell. President Garner's decision—especially his decision to become part of the “leadership circle” for promoting the initiative—has placed the college in a position where it can quickly become a leader in the sustainability movement. This is especially true for the College's position within Iowa and the Associated Colleges of the Midwest.

Currently, Cornell is powered nearly completely by fossil fuels. Aside from the small solar panel system which contributes electricity to the 10th Avenue apartments, all electricity is purchased by Cornell from Alliant Energy, the local electric utility. Over half of Alliant's electricity is produced in coal-burning plants which are run on coal from the Powder River Basin in Wyoming. Cornell is considering participating in Alliant's Second Nature program, which allows customers to purchase a portion of their energy needs from renewable resources. The majority of Cornell's buildings are heated through a central steam boiler system. Few buildings at Cornell are air-conditioned; those that are have individual outdoor units.

Cornell recently installed a new lighting system in the Small Multipurpose Sports Center. The previous lights, which were 1,000 watt metal halide fixtures, were replaced with high-efficiency T8 fluorescent lights. The new fixtures, which cost \$51,812.40 in total, consume less than half the energy of the old fixtures. During the recent renovations of the Commons eating area, incandescent lights were replaced with high-efficiency fluorescent lights which consume less than half the energy of the old bulbs.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Create an **energy policy** which commits to using renewable energy sources (ideally, 100%)
- Have a thorough campus **energy audit** conducted by a certified outside source.

Short-term Goals:

- Replace all campus lights with **high-efficiency fluorescent** bulbs.
- Install **Vending Misers** on all campus vending machines.
 - Because several Cornell machines are in low-traffic areas (e.g. the basement of West Science and first floor of Pauley-Rorem), the savings from such devices are likely to be high.
- Replace all campus exit signs with **high-efficiency signs** which use LED or LEC lights.
- Reduce energy consumption by lighting:

- Install **motion-sensor** lights in hallways, bathrooms and other appropriate places.
- Encourage faculty members to turn classroom lights off after class.
- Reduce the energy consumption by **computers**:
 - Put signs on all computer-lab computers encouraging users to turn monitors off when they are done using them.
 - Encourage campus departments and offices to turn computers off overnight, if possible.

D. Purchasing

The United States, as a whole, is the consumer of approximately 25% of the world's resources, even though we comprise only 5% of the world's population (US EPA). Any large institution, be it a corporation, university, or even a relatively small college such as Cornell, will inevitably make a significant contribution to this unimaginably huge consumptive force.

Some products necessary to the function of a college, such as building materials, furniture, and office equipment, are purchased once and "consumed" over a long period of time; other items, such as paper products and cleaning supplies, are purchased and consumed in a perpetual cycle. The cycling rate impacts both the college budget and the broader world.

In general, it is not feasible to look at consumption from an "all or none" perspective because the vast majority of items purchased and consumed by a college are not superfluous. However, every institution does have "purchasing power," that is, "the power to make choices among a range of available goods and services" (Rutgers Solid Waste Policy Group). Institutions can use this power to make a value statement about the environmental and social impacts of purchased goods.

The United States Environmental Protection Agency's Environmentally Preferable Purchasing (EPP) program was started in 1998 to "help executive agencies prevent waste and pollution by considering environmental impacts along with price and performance...when deciding what to buy" (www.epa.gov/oppt/epp/index.htm). This program can be viewed as a model of how a consumer, in this case the single largest consumer in the United States (the Federal Government), has acknowledged the significant impact of their purchasing decisions and become committed to lessening that impact.

As defined by the EPA, environmentally preferable products or services are those which "have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose" (www.epa.gov/oppt/epp/index.htm). They further explain that environmental preferability looks at the entire lifecycle of the product, the way the product is used, and the way it compares to similar products.

i) What happens at Cornell?

Environmentally Preferable Purchasing has not been institutionalized as a standard policy or priority at Cornell. Although it is stated that environmental concerns are taken into consideration when taking price quotes for various products, it is unclear how frequently these concerns are a significant factor when making final purchasing decisions.

The college is currently undergoing a transition from incandescent to fluorescent lighting fixtures in all campus buildings, but the transition is not complete. For instance, the lighting in the Small Multi-sports Center was recently upgraded to high-quality energy-efficient lights, but Bowman-Carter Hall is still lit by incandescent bulbs.

The paper used for printers and copiers across campus is a mix of non-recycled and recycled content. The mail center, for instance, uses between 20 and 30 reams of paper per week; about ½ of this amount is 30% post consumer fiber content and the rest is virgin paper.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goal:

- Establish a campus-wide **policy** to follow **environmentally preferable procurement guidelines** which emphasize products that have a minimal environmental and social impact.

Short-term Goals:

- Use **unbleached post-consumer recycled** content paper (at least 30% and ideally 100% in all college offices and facilities, including official letterhead and documents).
 - The bleaching process is highly toxic and recycled-content paper helps limit the use of virgin wood.
- Use unbleached, recycled-content toilet paper and paper towels.
- Encourage departments and offices to consider environmental preferability in purchasing decisions; include a statement about environmental preferability in the academic purchasing guidelines.
- Create a **green-purchasing guide** of environmentally-friendly goods, services and businesses in the greater Mount Vernon area.

E. Transportation

Transportation, both the act of driving and the infrastructure of roads and parking lots which supports it, is responsible for wide-ranging social and environmental impacts. These impacts include energy consumption, international fuel dependency, loss and/or fragmentation of farmland and wildlife habitat, air, water and land, and noise pollution, and harm to human or animal health.

The average car emits its own weight in CO₂ every 6,000 miles (Environmental Transport Association). According to the US EPA, the transportation sector produced 27% of total US greenhouse gas emissions in 2003, is the fastest growing producer of greenhouse gasses, and is already the largest source of atmospheric CO₂. However, these values actually underestimate the true environmental impact of fossil fuel dependence because they do not include the emissions produced during other aspects of the fuel lifecycle, such as extracting, manufacturing, and transporting it.

Vehicles which require gasoline emit exhaust which is composed of a variety of compounds harmful to human and environmental health. The most notable of these pollutants include: carbon dioxide, the greenhouse gas which is the main driver of climate change; carbon monoxide, a gas which is lethal to humans and is the major contributor to smog; particulate matter, a fine substance which is hazardous to human health and is a cause of haze; nitrous oxides and sulfur dioxide—rapidly oxidized compounds which contribute to smog and are the main causes of acid rain.

Compared to large universities which typically have road-dominated campuses and must devote large amounts of space to parking garages and lots, a small college setting is relatively conducive to reducing vehicle use. Although small town colleges cannot benefit from public transportation, residential colleges free students from needing to commute to school each day, which greatly reduces their need for transportation, public or personal. However, roads and parking lots are dominant features on many college campuses and irresponsible use of vehicles—namely driving out of convenience rather than necessity—is still prevalent.

Campus initiatives to address transportation issues should have an overall goal of reducing vehicle use. This goal should be evaluated while respecting the varying needs of different types of transportation-users. For instance, on-campus and off-campus students have different needs, as do faculty and staff who live in Mt Vernon versus those who reside in more distant communities.

i) What Happens at Cornell?

Campus community members get to campus in a variety of ways. Since a very small percent of students (approximately 10%) are permitted to live off campus, the vast majority of students live in on-campus dorms, eliminating the need to drive to class. Of the students who live off campus, the majority live in Mount Vernon, within an easy walking distance from Cornell. However, these students may drive to campus, especially during the winter months. Many local faculty and staff members walk or ride bikes, but some also drive. At this time, the relative percentages of Cornell community members traveling to campus by each mode have not been quantified.

A total of approximately 1100 vehicles are registered on campus each year. Cornell does not currently support a ride-share program, possibly because the majority of students, faculty and staff live within Mount Vernon, and those who live elsewhere (namely Cedar Rapids or Iowa City) do not necessarily live near other individuals who might be commuting at the same time.

Cornell does have enough parking to meet student demand, which is reevaluated each year based upon the previous year's number of registrations. Cornell has 21 parking lots, which range in capacity from 4 to 165 vehicles. To park in these lots, students must pay an annual fee of \$45.00 and faculty/staff must pay an annual fee of either \$35.00 or \$17.00, depending on their wage.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Replace current college-owned vehicles with **alternative fuel**-vehicles.
 - After the initial investment, money would be saved on gas, and it could be used as an educational venue.
- Build new parking lots with **permeable surfaces** to reduce water run-off.
- Create a **car-share** program for Cornell community members.
 - If students knew that they would have access to a car, the number of students who feel obligated to have a car on campus would likely decrease.
- Begin a project to convert used cafeteria vegetable oil into **biodeisel** fuel.
 - 100% biodiesel produced from vegetable oil produces emissions which are significantly cleaner than traditional diesel (www.biodiesel.org).
 - By recycling a waste product on campus, costs of waste disposal will decrease, as will the cost of fuel purchase.
 - Students will benefit educationally by being part of the project.

Short-term Goals:

- Establish **rideshare** programs for faculty and staff who commute from Cedar Rapids or Iowa City.
- Encourage all Cornell Community Members, including Campus Safety and FBG, to limit **vehicle use** to situations where driving is absolutely necessary.
- Instate a **reward system** for students, faculty and staff who register high-efficiency or alternative fuel vehicles.
 - Incentives could include a reduction in parking fees, parking privileges (such as designating a few "prime" spots in each parking lots for use by cars with

- ...specially awarded permits), entry into a raffle for gas-station gift certificates, bus passes, or other transportation-related prizes.
- Organize **block break transportation** to popular locations such as Chicago, Iowa City, Twin Cities.
 - Having more transportation options may cut down on the number of students who drive home solo during break and could also help students travel to local areas of interest.

F. Waste

Because we live on a finite planet, the very concept of waste is incompatible with sustainability; there is no “away” for anything to be thrown. At the same time, however, waste—material which is no longer needed to perform its intended function—is an inevitable product of our modern lifestyle. According to the US EPA, United States residents, businesses and institutions produced greater than 245 million tons of solid waste in 2005; this was approximately 4.5 pounds per person per day. Even at a small college such as Cornell, the amount of waste generated can be staggering.

Waste can be addressed in a sustainable manner in two primary ways: through properly dealing with the waste once it has been generated, and by targeting the source and reducing the amount of waste generated in the first place.

The waste-reduction approach, which the EPA has ranked as the top priority for waste management, is especially significant from both an ecological and an economic perspective. Waste reduction includes buying only what is necessary and extending the useful lifetime of all products. If this goal is emphasized, money will be saved through reduced procurement and reduced disposal, and resources will be saved through slowed production and slowed contamination. Waste reduction in the college setting may best be achieved through innovative programs and campaigns which help give students—and all members of the college community—a sense of ownership of and responsibility for the waste they generate.

If waste must be disposed of, it should be evaluated to determine which method of disposal is most appropriate. Basic categories of waste include nontoxic solid waste and hazardous waste. Solid waste can be broken down into waste which is composed of materials that can be recycled, organic waste that can be decomposed, and non-recyclable, non-biodegradable waste that must be landfilled. Hazardous waste, once generated, can not typically be reduced or detoxified. Instead, it must be handled and disposed of with great care so that contamination does not occur.

i) What happens at Cornell?

Solid Waste: Cornell generates about 275 tons of solid waste each year. Waste collected on the main campus, including dorms and academic buildings, is put into a compactor located behind the Commons (a secondary, smaller, compactor is located near the Sports Center), at the rate of 10 to 12 tons generated in a 14 or 15 day period. A waste assessment completed for this project found that, from 16 bags of trash collected from the campus dorms, recyclable material was 30% of the total (by weight), compostable material was 29%, and true solid waste was only 33% of the total. The cost of solid-waste disposal was \$30,000 for the 2005-2006 academic year. The biggest surge in volume of waste occurs at the end of the year, approaching student move-out, when dumpsters are located near each dorm and students fill them with unwanted items— some still useable.

Recycling: Cornell’s recycling program was initially started in 1995, and, after a lull, was restarted in spring of 2002 by a student initiative. The students use a van to collect recyclables from campus buildings, then sort the material in the basement of the Commons. Recyclable items include cardboard and paper products (including newspaper, magazines, receipts, paperback books, junk mail, office paper,

cereal boxes and index cards), aluminum, tin, plastic types 1-7, and clear and colored glass. Cardboard is recycled separately through the college FBG service. Twice each week, the students drive the collected material to Bluestem recycling center and landfill in Marion.

The recycling program is overseen by a volunteer faculty member who supervises the work-study students. During the current 2006-2007 academic year, there are 7 student workers, but this is considered under-staffed. Funding in the amount of \$3000-\$4000 is provided by Federal Work Study. Facilities Management supplies the van, gas, and bags. No income is received from the recyclables, but there is no fee to drop items off. Because the program is run on student labor, there are no opportunities to recycle on campus during summer break or at the very beginning and end of each academic year.

Composting: Organic lawn waste is composted. Food waste from the kitchen and cafeteria, however, is not (see section on Dining Services for more information).

Hazardous Waste: The Biology and Chemistry departments are the main sources of academically-generated hazardous waste, although the Geology and Art departments make small contributions. The waste generated at Cornell includes toxic, flammable and corrosive wastes. Academic hazardous waste is disposed of every 5 years, through contracts with disposal companies such as Pollution Control Industries. As Cornell has no control over final treatment of the waste, the percentages of the waste which are incinerated or landfilled is unknown. The most recent disposal included approximately 400 containers of hazardous waste, ranging in size from a few grams to 4 liters; the disposal of this waste cost \$7000. Of this, approximately 75% was composed of chemicals which had been present in the West Science stockroom but which were deemed no longer usable. The majority of the rest of the waste was generated in lab experiments. Because a significant effort has been made during the last 15 years to remove unusable chemicals from the storeroom, the amount of hazardous waste generated by Biology and Chemistry has been decreasing.

To limit or reduce the amount of hazardous waste generated in Biology and Chemistry labs, waste generation is a factor which is considered when lab exercises are chosen. For this reason, many experiments requiring toxic materials have been eliminated or modified for safety reasons. Consequently, the majority of labs generate no hazardous waste. Additionally, mercury thermometers have been replaced by alcohol thermometers to reduce mercury waste. Hazardous and non-hazardous materials are not mixed, to avoid contamination of large quantities of materials. For aqueous wastes containing metals, the metals are precipitated from the solution before disposal, which can reduce the weight of the waste by 99% or more.

Some microscaling of experiments has been done, both to reduce hazardous waste and the amount of chemicals purchased. However, microscale glassware kits have not been purchased, primarily due to the high expense (kits cost \$190 or more per student) and also because some experiments are not as effective when done in microscale.

Although there is not a campus-wide inventory or tracking system for hazardous materials and waste, all chemicals and wastes are continually inventoried by the Biology and Chemistry departments.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Create a general campus attitude of **waste reduction** and **pollution prevention**.
- **Compost** all organic waste, including food and lawn waste (See section on Dining Services for more details).

- Implement a **pay-for-print** system similar to that at the University of Colorado and the University of Indiana.
- Create a formal **hazardous waste policy** which addresses appropriate procedures for handling and disposing of the waste.

Short-term Goals:

- Enhance the **recycling** program:
 - Reevaluate bin **placement** and consider placing bins next to garbage cans so that recycling is more convenient and visible.
 - **Extend** the program to continue operating during the summer and, especially, at the beginning and end of the academic year.
 - Organize an **end-of-the-year** recycling opportunity for professors to clean their offices of unwanted books and other large materials
- Expand end-of-the-year opportunities for students to **donate** unwanted items rather than throw them away.
- Reduce **junk mail**. Discourage the practice of mass-mailings or, if they must be done, encourage small pieces of paper.
- Encourage professors to use **online resources** for turning in and grading assignments, posting syllabi, and distributing articles.
- Maximize the use of **double-sided** copying/printing.
 - If possible, make double-sided printing the default on all machines.
 - Encourage faculty members to accept double-sided assignments.
 - Encourage all departments and offices to use double-sided printing.

G. Water

For most people in the U.S., water simply comes out of the tap, hence, many people end up thinking of water as a free and endless resource. This is especially true in regions such as Iowa where severe droughts are not common occurrences and rivers are more prone to flooding than running dry. However, minimizing water use is critical for conserving both water and other resources. Fundamentally, water not released from a faucet represents water not claimed from a river, aquifer or reservoir. Also, the process of using water consumes energy to run pumps for transport, and for the treatment process. Excess water use may also lead to altered stream flow, saltwater intrusion, habitat destruction through the damming of rivers, land subsidence, and high levels of runoff polluted with chemicals and sediments.

Tools for water conservation can be divided into engineering practices and behavioral practices. Engineering practices are structural implementations which are installed once and reduce water consumption as long as they are in place. Some of these, such as low-flow toilets, showerheads, faucet aerators, and water catchment systems can be installed in any building while others, such as graywater reclamation systems, are better installed during initial building construction. Behavioral practices which conserve water should be encouraged at all times to reduce water use, making the engineering practices more effective.

Water conservation efforts are economic because water saved equals money saved. Even engineering practices that require equipment to be purchased will typically have reasonable pay-back periods resulting from the amount of water saved. Water conservation, both structural and behavioral, can take place both indoors and out.

i) What Happens at Cornell?

Cornell purchases its water from the City of Mount Vernon. During the 2005-2006 year, the college community consumed 2,958,690 cubic feet of water, which cost the college \$77,340. Approximately

8% of this total amount of water was used outdoor for lawn and athletic field irrigation. On the campus grounds, sprinkling is done on an as-needed basis.

In 2005-2006, the Cornell community generated 2,721,120 cubic ft of waste water, which was treated by the city of Mount Vernon in its treatment plant off of Highway 30. The cost for this service is automatically set to be half of the total water input cost, so, for 2005-2006, wastewater treatment cost the college \$38,670. The treated wastewater is discharged into the Mount Vernon sewer system.

As there are no attempts to slow or divert storm water runoff, all runoff flows directly into a body of water. There are currently no water reclamation or rainwater harvesting projects at Cornell.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Create a college-wide water conservation **policy**.
- Install **gray-water reclamation** systems in new buildings to reuse gray-water.
- Install a **water catchment** system to collect rainwater for irrigation.
- Install **high-efficiency washing machines** in all dormitories.

Short-term goals:

- Install **low-flow** showerheads, faucet aerators, and toilets in all buildings.
- Use **xeriscape** landscaping practices to reduce water demands by basing gardens on soil type, plant selection, and careful maintenance. (see section on Buildings and Grounds for more information)
- Repair **leaks and drips** as soon as possible.
- Create a water-**conservation campaign** encouraging people to (among other things):
 - Wash full loads of laundry and use cold water.
 - Take short showers.
 - Turn off the faucet while brushing teeth.
 - Wash cars rarely, and use a bucket rather than a hose or carwash.

H. Structure and Opportunities

In order for the operational aspects of sustainability to reach their full potential, there must be complementary support from other sectors of the college community. Thus, a final criterion for measuring sustainability is the campus structure and opportunities which exist to support sustainability efforts. Strong institutional structure has helped many colleges and universities to create hugely successful sustainability initiatives. Cornell University's "Campus Sustainability in Higher Education" survey of sustainability programs at 28 leading institutions asked the schools to comment on the strategies and tools that had been most successful at implementing sustainability on their campus. The most popular response was "full-time staff positions," followed by "environmental advisory council" and "student leadership." Other answers included: "top-down leadership," "master plan," "staff training," "combining diverse efforts," and "conferences/networking." The clear message is that successful sustainability campaigns are not formed of isolated initiatives from a variety of players; they are strong, unified efforts which rely on the entire campus to function effectively and benefit greatly from centralized leadership.

Structural mechanisms for change can include policies and statements, both general and issue-specific, advisory committees and task forces, and specialized staff positions. Less directly, they can include Environmental Studies programs. These programs can extend in a true interdisciplinary fashion, as classes of all fields can incorporate sustainability into their curriculums and students and faculty can collaborate on projects which can be directly applicable to furthering sustainability on campus. Initiatives can then be used as classroom extensions and living laboratories to show "sustainability in

action.” Opportunities for education can also exist outside of the classroom, with workshops for faculty, staff or students.

Other opportunities for integrating sustainability into a campus can occur within all aspects of student life, including Residence Life and student organizations. This full integration is especially important on a residential campus because all student behaviors, such as how much energy they use in their dorm rooms and how willing they are to recycle, greatly and directly impact the campus. The student education initiative should become an integral part of New Student Orientation so incoming students can begin to learn how to live sustainably during their first comprehensive introduction to the College, before the habits have been formed.

Finally, campus sustainability can be affected by the way an institution presents itself and its campaign. Consequently, mechanisms for sustainability initiatives must include components of internal marketing, institutional outreach, and publicity (both internal and external). Outreach should also involve networking with other institutions, either directly or through organizations and alliances so that experiences can be shared.

i) What Happens at Cornell?

Institutional Structure and Opportunities

While the college as a whole does not explicitly emphasize sustainability in its mission statement or strategic plan, both the Geology and Environmental Studies Department Fact sheets mention finite resources in their preambles. Survey results indicate that more than half of the Cornell faculty and staff are in favor of extending the mission statement to include sustainability (Appendix 1 figure 5). President Garner has signed the Presidents Climate Commitment, but he has not signed the Talloires Declaration. According to the survey completed for this report, faculty and staff thoughts about the Declaration are mixed, but suggest that more individuals would be supportive of a decision to sign the Declaration than would oppose it (Appendix 1 figure 6).

All current classes, research projects, or practices which address sustainability or environmental themes are products of faculty or staff initiative, as no formal programs exist to educate faculty and staff members on ways to integrate sustainability themes and practices into their classes or procedures. Initiating workshops or other learning opportunities could be both valuable and appreciated: results of the survey completed for this report suggest a disconnect between interest in sustainability and knowledge about it (Appendix 1 figures 7 and 8). The discrepancy between knowledge and interest could be reduced by providing more educational opportunities for faculty and staff members to learn about sustainability and how it relates to their positions.

Academic Opportunities

Cornell has had an Environmental Studies program since the early 1980s. The present configuration of the program was instituted in 1998-99. The interdisciplinary major has historically (and is currently) led by the Geology Department and is overseen by a committee of faculty members from a variety of disciplines. Currently, 13 professors in 7 departments teach courses which are included in the Environmental Studies program. However, the major has no independent budget and no dedicated faculty leader. Although there are a number of courses which address environmental issues, there are none which specifically focus on sustainability. There is currently no general education requirement ensuring that all students take a course related to sustainability or ecological literacy. In the survey completed for this report, faculty and staff were closely split for and against such an addition (Appendix 1 figure 9).

Student Life

There is a small, but active, student Environmental Club, which strives to educate the community on environmental issues and promote an appreciation of the natural world, and a handful of other student organizations relate to the environmental and social aspects of sustainability in some way. These organizations include the Geology Club, which promotes geologic inquiry and camaraderie; the Mountaineering Club, which provides opportunities for outdoor and adventure recreation; the Union of Progressive Students; the Cornell Dems; the Third Wave Resource Group, a living and Learning Community which promotes local and global women's issues; and VIGOR, a Living and Learning Community which seeks to heighten environment awareness. Presently, there is little cross-membership between the groups, but joint efforts in event sponsorship are beginning to form. Beginning with the 2007 graduating class, Cornell students will have the opportunity to sign a "graduation pledge" to consider the social and environmental impacts of their future actions and decisions.

ii) Opportunities for Change

(Refer to Appendix 3 for case studies from other academic institutions)

Long-term Goals:

- Incorporate sustainability into the **Strategic Plan**.
- Sign the **Talloires Declaration**.
- Write a Sustainability **Mission Statement**.
- Hire a sustainability **coordinator** who reports directly to the President.
- Create a **committee**, ideally chaired by the staff person.
- Incorporate sustainability into the new **BA** requirements.

Short-term Goals:

- Host a year-long event similar to Furman's "**Year of the Environment**," but use a more neutral title.
- During **New Student Orientation**, include information on living sustainably at Cornell.
 - First-year students will be learning behaviors in their new environment for the first time, so Cornell habits have not yet been ingrained.
 - Sustainable practices should be integrated into all appropriate aspects of NSO, rather than in a separate "sustainability workshop" so that the behaviors will be integrated into all aspects of Cornell life.
- Add a paid **Eco Rep** position to Hall Councils.
- Create a pool of money for **minigrants** which faculty and students can apply for to conduct projects on sustainability. The projects must have results that can then be used for creating positive changes on campus.
- Host a series of "**Sustainability Café**" events held at local restaurants and at Cornell as a venue for people of the Mt Vernon community to talk about sustainability.
- Host a series of **speakers** and documentaries on sustainability topics.
- Create an **incentive** program for students who are doing sustainable actions. This could be done in the style of intramural sports with different actions (eg, having a fuel efficient car, shopping at the Farmer's Market, bringing reusable mugs or plates to be used at the Ratt, nominating people for a sustainable recognition, etc.) students can do to earn points and win prizes.
- Once a block, **recognize** things that community members have done/are doing which relate to sustainability. This could be arranged through Res Life's "Of the Block" program.
- Make all-campus events **zero-waste**. For instance, the homecoming picnic could use biodegradable plasticware and plates; composting the waste could likely be arranged through a local farm.
- Encourage professors to incorporate sustainability themes into existing **classes**. For instance, even math classes could use data which connects to real-life sustainability issues.
- Sponsor **training** for faculty and staff on pertinent sustainability topics.

Cornell Sustainability Surveys

In order to assess the Cornell community's knowledge of and thoughts on sustainability, all faculty, staff and students were invited to participate in a survey. Approximately 40% of the student body participated in the Residence Life survey, which included questions on sustainability, and 41% of the total faculty and staff participated in the sustainability survey. Some of the survey responses are discussed below and the rest are addressed where applicable throughout this report. The survey questions and responses can be found in Appendix 1.

Campus Priorities

To evaluate community opinions of sustainability as compared to other campus priorities, participants were asked to divide a hypothetical surplus \$1 between particular categories. In the student survey, the categories were scholarships, renovations, activities, sustainability and "other;" in the faculty and staff survey, the categories were salaries, program support, facilities, sustainability and "other" (Appendix 1 tables 1 and 2).

It is interesting to note that the categories given the largest average fraction of the dollar were analogous for both surveys: scholarships (29 cents) and renovations (28 cents) for students and salaries (30 cents) and facilities (25 cents) for faculty and staff. The high ranking of facilities and renovations suggests that the community is cognizant of Cornell's operational needs. These needs can, of course, be combined with sustainability as two as mutually-benefiting priorities.

Sustainability was, on average, granted a relatively small portion of the \$1: 21 cents by students and 17 cents by faculty and staff. However, because sustainability can be combined with so many of the other categories, it need not only be thought of as another category competing for limited funds. Viewing sustainability in this way may increase community willingness to commit monetary resources to it.

Sustainability Priorities

In order to evaluate community priorities, each survey asked participants to rank sustainability issues in order of most to least critical. The faculty and staff survey included 10 issues and the student survey included 5. Results of the rankings can be seen in Appendix 1 figure 10.

The top two issues in each survey were recycling and renewable energy, in that order. Recycling and renewable energy are important issues, but they are also the sustainability issues which tend to get the most publicity, so this may have influenced the way they are perceived. Yet, because the Cornell community is already relatively knowledgeable and enthusiastic about these issues, these subjects may be effective issues with which to begin a larger campaign.

The averaged priorities from the surveys tend to show higher priority given to issues which are greatly impacted by the behavior of individuals. Especially in the college setting, issues such as green building and purchasing, pesticide use, composting, and organic/local fuel are almost completely contingent upon blanket college decisions rather than decisions of individuals. More education about issues such as green building and purchasing will be useful for helping the community understand the importance of those issues and generating support for future administrative initiatives.

Sustainability for Cornell

It is apparent that there is much Cornell can do to become a more sustainable institution. This section includes a model plan for how the beginnings of a sustainability movement could be constructed at Cornell. Because creating a successful campaign will require careful thought and planning, the section also includes information about framing a campaign, creating a campaign structure, extending the campaign into a widespread movement, finding the financial balance between money spent and money saved, and gives a partial list of opportunities for further investigations on the topic of campus sustainability.

Action Plan

2008 will be the 30th year of the OCAAT system at Cornell. What better way to celebrate this radical and successful program than to extend it, thereby unifying and strengthening the Cornell community? Cornell should honor the tradition of being bold by initiating another innovative program. In recognition of the 30th anniversary of OCAAT, I offer a blueprint for the beginning of such an initiative, ultimately to be implemented over a 30-year interval.

A 30 year-period is a reasonable timeframe to use for designing a sustainability action plan. Some changes should happen, or at least be set in motion, immediately, while others will not be practical for some time. A 30 year plan will allow the longevity of an academic institution to be used in planning. While very few members of the Cornell community will still be active at Cornell in 30 years, setting goals with a long-range perspective will be a legacy for those who come after us.

The proposed plan is ambitious and pragmatic, and I have tried to create it with the understanding that limited resources and competing priorities will make the realization of the entire plan difficult to achieve. Implementing the plan will require the collaboration of many individuals who are intimately involved with the many layers of college operations and goals. For that reason, the creation of a detailed 30 year plan is beyond the scope of this thesis. Instead, I propose a model plan for beginning the process. This model tries to show how some initiatives for creating a widespread paradigm shift can begin at once, concurrent with setting up the framework for the larger-scale changes that will come. It is written with the knowledge that not all actions will be taken, but with the hope that some will.

2007-2008:

- Create a **permanent committee**. Eg. *Focus on the Future* committee with a subcommittee *Focus on Climate Change* (mandated by the Presidents Climate Commitment).
 - Write a *Focus on the Future* mission statement for the College.
 - Design a long-term plan for the comprehensive initiative.
- Conduct an **audit of greenhouse gas emissions** (mandated by the Presidents Climate Commitment).
- **Recognize** pairs of students and faculty members who embark on **independent study projects** investigating specific facets of the sustainability initiative.
- Participate in **Focus the Nation** (host a series of events through-out the first half of the year, culminating with a symposium on Jan 31, 2008).

2008-2009:

30th year of OCAAT

Class of 1958 class gift

- Conduct a **comprehensive environmental audit** (1st in series with 5-year increments)
- Sign the **Talloires Declaration**.
- Host a **year-long kickoff** for the comprehensive initiative:

- Incorporate sustainability initiatives into **NSO**.
- Hire a **coordinator** for the initiative.
- Begin **EcoRep** position for Hall Councils.
- Select a **speaker** for the opening convocation who will address the initiative.
- Transform all-campus events (such as picnics) into **zero-waste events**.
- Begin recognizing active individuals with **Eco Awards**.
- Begin giving **minigrants** for projects.
- Begin intramural competition as an **incentive program**.
- Begin a **speaker series** of young academics studying cutting-edge topics related to sustainability.

Goals to reach by 2012:

- Sustainability is written into the **Strategic Goals and Mission Statement**.
- Written **policies** and implementation **plans** are in place for:
 - Environmentally Preferable Purchasing
 - Energy
 - Green Building
 - Pest Management
 - Water
- Active **pilot programs** are in place for:
 - Composting food waste
 - Rainwater Harvesting
 - Xeriscaping
- All faculty, staff, and students are aware of the initiatives and are **active participants** in some part of the program.

Every member of the Cornell community will have important roles to play in order for the movement to be successful. Some of the most important of these roles are listed in appendix 5.

Framing the Campaign

The term sustainability has consciously been used in this report because it is a term which can be defined and utilized in a productive manner. However, Cornell's movement should be centered not on the *word* sustainability, but on the *concept* of sustainability. This would create a movement which is radically different from that of any other institution that I have come across. The standard approach among colleges and universities is to launch multi-faceted sustainability and environment oriented campaigns. With slogans such as "Brown is Green" "Sustainable Bowdoin" and Grinnell's "EcoCampus," there is no question that these are *environmental* programs.

Sustainability tends to be used as a unifying theme, and it is, but the unifying aspect of the concept can too often be counteracted by the dividing aspect of the word itself. For instance, in her booklet *Mainstream or Forever Niche?* Gordon (2002) reports results from a survey in which she asked consumers to describe "green" as if it were a brand. Some responses were positive, but they also ranged from "wacky, alternative, annoying, opinionated, virtuous and responsible" to "argumentative, militant and intolerant" to "far too depressing and far too serious." The reality is that the words "sustainability" and "environmental" and "green" are controversial, but the actual components of them, such as maximizing resource efficiency, conservation of resources and thinking for the future, are not.

One way Cornell could frame its sustainability movement is as one component of a more comprehensive campaign. For example, one campaign approach could be *Focus Cornell*¹, an umbrella campaign with the primary function of unifying all aspects of Cornell. The *Focus* campaign could be extended in a variety of ways such as *Focus on Academics*, *Focus on the Arts*, *Focus on Traditions*, or *Focus on the Future*. The bulk of the sustainability initiatives could fit under the *Focus on the Future* component, and a staff person could be hired and a committee formed under that title. This staff position and committee would be equivalent to the Sustainability Coordinators and Environmental Councils at other institutions, with the primary difference being the outward presentation. Because the future is something shared by everyone, a sustainability campaign which is framed around “future-proofing” (a term used by Furman University) the institution is more likely to be successful than one which only markets itself as “becoming sustainable.” The umbrella campaign would also lend itself to more specific issues such as *Focus on Efficiency*, *Focus on Waste Reduction* and *Focus on Climate Change*. The last example could be the framework for Cornell’s initiatives relating to the Presidents Climate Commitment.

To unify the entire college community, I think Cornell’s sustainability movement should be:

- **Empowering:** Community members must feel as though they can make a positive difference; if they feel guilty or challenged they will be less likely to be involved.
- **Incentive-based:** When possible, sustainable behaviors should be rewarded; penalties for unsustainable behaviors should be kept to a minimum.
- **Mainstream:** the campaign cannot appear optional or radical; if it is, many individuals will dismiss it on those grounds alone. It must appeal to a wide audience.
- **Patient:** Large-scale change will take time; each incremental change should be documented and celebrated so that community members can have a positive reinforcement to know that their actions are making an impact.
- **Strategic:** Easy changes should be made first. Efforts to changing mentality and behaviors should begin immediately. Time should be given for lengthier processes such as writing policies and making larger operational and structural changes.
- **Supported:** The movement needs to be supported from the whole campus community, with strong support from the top of the administration. Community members, including faculty, staff and students, should be recognized and rewarded for their efforts. It should be clear that contributing to the efforts is valued and will not count as deviation from regular duties.
- **Unified:** The initiative must take place simultaneously on multiple levels with same goal in mind; the efforts must be coordinated so that they can build upon one another and complement each other rather than duplicate things or compete for the same limited resources (time, money, people, etc).
- **Visible:** The campaign should be noisy and noticeable enough so that it is virtually impossible for a community member to be oblivious to the efforts. The initial kickoff should be a big event, and the momentum from that should be maintained. An effort should be made to attract attention of the Cornell community, receive external publicity, and be known to potential donors and prospective students.

¹ Focus the Nation is a group with the goal of unifying colleges and universities throughout the country through the implementation of simultaneous educational campaigns about Climate Change, culminating on Jan. 31, 2008. The overlap in names should not be a problem, especially because this organization is based upon a single event that would likely take place before Cornell’s campaign began.

Creating a Structure

In order to have longevity, sustainability campaigns must have both a written framework and a human resource framework. One form of a written structure is an Environmental Management Plan—a comprehensive plan which simultaneously defines goals and strategies, from both ecological and economic perspectives, and provides the means through which they can be implemented.

Environmental Management Plans are endorsed by the college President and board of trustees before being implemented throughout the institution. A central component of an EMP is a comprehensive statement of policy, which is often incorporated into the Strategic Plan and/or Mission Statement of the institution.

Successful sustainability programs also have well-organized human resources with high degrees of institutional authority. A combination of a staff member and a permanent council or committee can be an effective way to create and implement sustainability-related projects and to draft specific policies. Committees, however, require a significant degree of commitment from their members and careful direction to ensure that they are productive rather than symbolic. The survey completed for this report shows that, overall, the Cornell faculty and staff appear to be supportive of the idea of forming a sustainability committee. The majority of respondents were in favor of a permanent committee and a significant percent (31%) expressed interest in being personally involved (Appendix 1 figures 11-13).

There are many advantages to instituting campus sustainability with leadership from a coordinator. However, care should be taken to ensure that the sustainability coordinator is effective and respected. According to the survey completed for this report, the idea of creating a new staff position is not extremely popular, with 28% of faculty and staff in favor of it (Appendix 1 figure 14). Some possible concerns about hiring a sustainability coordinator are listed below, along with my responses:

- **Concern:** *A coordinator will just be “one more administrator.”*
 - **Response:** Having an administrator for sustainability shows institutional commitment to the issue. Also, a sustainability administrator will be unique because they will be closely involved with academics, operations, and student life and will provide a direct connection between all members of the college community and the college president.
- **Concern:** *Salaries are already low; there aren’t enough funds for a new position.*
 - **Response:** As demonstrated in the analyses by Cornell University and Carleton College (Appendix 6), sustainability coordinators are effective at creating changes which save the institution money and essentially pay for their own positions. Also, no current staff person has time to write grants, coordinate projects, chair a committee, etc; a new position is necessary to take these critical roles.
- **Concern:** *An outside person won’t know how the college “works.”*
 - **Response:** Many institutions hire coordinators who are fresh out of graduate school. Doing so can be beneficial because these individuals are enthusiastic and full of new ideas. However, because the coordinator is such an important position, the person who fills it should already have experience, ideally at the institution in question, and must be a person who can gain (or already has) the respect of senior faculty and staff members.
- **Concern:** *Hiring a coordinator will make sustainability look like an issue which can be solved by one person.*
 - **Response:** The primary role of the coordinator will not be single-handedly creating the college’s sustainability campaign, but networking with all areas of the institution to build a sustainability campaign off of the institutional framework and other assets that already exist.

Creating a Movement

Even if a campaign has been properly framed with strategic language and has been structured for longevity with an EMP supported by a permanent staff person and committee, it will not be successful unless a true movement can be generated. Initiating a movement involves creating enthusiasm and behavioral change, both of which can be difficult to maintain on a large scale.

The role of enthusiasm should not be underestimated, because the way that the process of change is viewed by participants is critical to the success of the desired change. Two ways to maintain positive momentum are to: 1) focus on solutions rather than problems and 2) celebrate small successes while working toward large goals (www.worldchanging.com).

Although creating campus sustainability movements is a relatively new phenomenon, the same goals involving widespread behavioral influence have been developed in settings such as marketing “green” products and creating social change movements. The following valuable lessons can be learned from green product marketing campaigns and social change models (*Fostering Sustainable Behavior*).

- *Highlighting only the green attributes of a product is not effective.*
- *Education, alone, is not enough to change behavior.*
- *Economic incentives, alone, are not enough to change behavior.*

It is easy to extend these concepts to a college campus setting. Each initiative, green building, energy conservation, rain water harvesting, etc., can be treated as a product which needs to be sold to the college community. In the publicizing/marketing process, education and economic incentives can be useful, but they should not be the sole strategies employed.

A program called Community-based Social Marketing has been developed to create behavioral change by targeting specific barriers to specific desired actions. This method has been used successfully in many sustainability-related endeavors. Information about this approach can be found in Appendix 7.

Another program that can be used to create successful change campaigns is the *Getting To Outcomes* (GTO) system through the Rand Corporation². The GTO is a model for designing, implementing, evaluating and sustaining programs aimed at creating desired behaviors. More information can be found in Appendix 7.

Changing behavior is not an easy task. However, if the behaviors are not seen as “environmental” and are framed with the perceived barriers removed so that the desired behavior is also the “laziest” behavior, widespread behavioral change can occur even without equally-widespread philosophical change. For instance, Republicans do not need to be converted to Green Party ideology in order for common goals to be found; it is possible for the desired behaviors to be framed in ways that are already appealing to many perspectives.

Money Spent and Money Saved

One of the biggest hurdles which sustainability initiatives must overcome is that the costs to sustainability are often perceived as outweighing the benefits. Members of the Cornell community have expressed concern about financing sustainability but also are aware of potential long-term financial rewards resulting from a more sustainable campus, as suggested by comments from the faculty and staff sustainability survey (Appendix 1).

² Please refer to Appendix 6 for contact information to one of the GTO creators.

Clearly, a commitment to sustainable practices at Cornell, or anywhere, must be implemented in a manner that is both holistic and pragmatic. Cornell is not presently in a situation of financial strength. However, sustainability need not be simply an additional expense. For example, the fact that Cornell has many facilities which need to be upgraded and renovated is an opportunity to implement green building practices which will save money for the college; this opportunity would not exist if Cornell were not already planning these construction and renovation projects. Also, many sustainability initiatives, especially those which focus on waste reduction, will be able to save the college money which can potentially be allocated to finance additional elements of the sustainability initiative.

Sustainability initiatives save significant amounts of money; programs at numerous colleges and universities have achieved substantial cost savings which have more than compensated for the cost of the program itself. For example, Cornell University's "Campus Sustainability in Higher Education" survey of sustainability programs asked institutions to report the amount of money that their sustainability initiatives had saved. Amounts reported by ten universities were in range of millions to tens of millions of dollars.

Although these values are all from large universities, the most successful sustainability strategies are the same for large and small institutions; when adjusted for scale, it is likely that Cornell could save a comparable amount of money with comparable sustainability initiatives. An example from a peer institution, Carleton College (Appendix 6) demonstrates that sustainability does not need to compete with already scarce funds. After an initial investment, many programs will be able to pay for themselves. Moreover, a visible and comprehensive sustainability program can also be an indirect source of revenue as it may attract potential donors and prospective students.

Opportunities for Student Investigations

Due to the comprehensive nature of this report, no single area was investigated in great detail. Consequently, many opportunities exist for Cornell students to complete independent-study projects which give in-depth accounts of particular sustainability issues and the ways in which they relate to Cornell. These projects would provide useful information to the Cornell community, and because they would enable Cornell to begin integrating sustainability into the college curriculum immediately, without adapting current courses or creating new ones. Potential projects include (but would not be limited to):

Dining Services: Local Food

- **Purpose:** To assess actual possibilities for Cornell to begin purchasing local food products.
- **Need:** Creating a priority to purchase local food is a good idea because it will decrease the environmental impact of Cornell's food products and will help the Iowa economy. However, local food can only be purchased by an institution to the extent that it is produced and available. Consequently, the first step toward integrating local food into a college cafeteria is not to write a policy declaring a certain percent of the food will have local origins but to do the background work to find out what local products are actually available at a large enough scale and at what cost.
- **Process:**
 - Work with Sodexo to learn of their policies and initiatives.
 - Contact Grinnell College to learn about the process through which local food was integrated into their cafeteria system, what local sources they use, etc.
 - Be realistic in scope. Think of creating a "local plate" with one meal's worth of local food.
- **Potential Contacts:**
 - Laura Krouse, Biology Lab instructor and organic farmer
 - Matt Steigerwald, owner and chef of Lincoln Café

- **Implementation Idea:** To gauge interest, host a Sodexo-sponsored meal produced from local products for students, faculty and staff who signed up in advance.

Dining Services: Composting

- **Purpose:** To assess possibilities for Cornell to begin composting food waste.
- **Need:** Composting food waste will greatly reduce the amount of solid waste generated at Cornell, which will in turn reduce the costs of waste disposal. Currently, the amount of food waste generated at Cornell it is unknown; without this knowledge it is impossible to accurately predict potential savings from a composting program. Also, there are many methods available for composting; an assessment of these methods would be valuable for choosing which would be most appropriate for Cornell.
- **Process:**
 - Work with Sodexo to learn of their policies and initiatives.
 - Conduct a waste-assessment study at Sodexo. Include both kitchen waste and student plate waste.
 - Contact other colleges with composting programs to investigate pros and cons of different methods.
- **Potential Contacts:**
 - Laura Krouse, Biology Lab instructor and organic farmer.
 - D and D Worm Ranch
- **Implementation Idea:** To evaluate how much food waste is thrown away per student during meals, create a “weigh station” for students to weigh their plates before scraping them. Volunteers who help with weighing the plates could earn service hours and students who volunteer to have their plate weighed could become eligible for a prize drawing.

Competitive Analysis of Sustainability programs

- **Purpose:** To evaluate sustainability initiatives at peer colleges (such as ACM or Iowa colleges)
- **Need:** Most analyses of sustainability programs are of initiatives at large universities. Although these are useful, Cornell would benefit from knowing what other initiatives have been implemented at peer institutions and what the costs and benefits of those programs are.
- **Process:**
 - Use websites and/or direct contact with schools to determine what their sustainability programs include.
 - Create a visual representation to compare sustainability programs (such as a chart showing presence/absence of specific initiatives).
 - Create detailed case studies of peer institutions with the most successful programs. Try to contact the schools to learn details of how the programs began and what the costs and savings have been.
- **Implementation Idea:** Use an analysis similar to that used in Cornell University’s “Peer Campus Sustainability Survey.”

Green Product Guide

- **Purpose:** To create a guide of local opportunities for purchasing environmentally preferable goods or services.
- **Need:** Iowa undoubtedly has many sources of environmentally preferable products and services but, to my knowledge, they have not been catalogued for easy access by interested consumers.
- **Process:**
 - Research environmentally preferable guides from other communities or institutions.
 - Investigate sources of environmentally preferable goods and services in the greater Mount Vernon area.
 - Format the information into a user friendly format.

- **Potential Contacts:**
 - Buy Local (national organization); a representative is at the University of IA.
- **Implementation Idea:** Format the final product in website form so that it will not need to be published on paper and any person with internet access will be able to use it.

Ink Pond

- **Purpose:** To evaluate the possibility of turning Ink Pond into a wetland
- **Need:** Ink Pond is not a healthy pond. If it is possible to turn the pond into a wetland, the pond's value as wildlife habitat would increase, as would its utility as a class-room resource.
- **Process:**
 - Investigate the feasibility of turning an artificial pond into a wetland.
 - Conduct an inventory of current plants and animals at the pond and an inventory of potential plants which could be part of the wetland and the animals they would likely attract.
- **Implementation Idea:** Conduct a survey to gauge opinions of Cornell students and faculty on the present state of Ink Pond.

Outreach and Publicity

- **Purpose:** To involve students in generating on-campus enthusiasm of sustainability themes.
- **Need:** In order for a sustainability campaign to succeed at Cornell, it must be highly visible on campus. Student involvement during the documentation process would help the college create a campaign with student appeal and would give students interested in communication fields a chance to experience putting together an actual outreach and documentation campaign.
- **Process:**
 - Keep up with all sustainability initiatives at Cornell, including student projects.
 - Interview Cornell community members, including students, faculty, staff and administrators (if possible) on their involvement with or thoughts about sustainability at Cornell.
 - Update the Cornell community on sustainability at Cornell; use website, newspaper, and other mediums for communication.
- **Implementation Idea:** Create a specific website for all sustainability-related information at Cornell.

Xeriscaping

Purpose: To evaluate the prospect of implementing xeriscaping techniques at Cornell

- **Need:** Xeriscaping reduces the water and maintenance requirement of landscaped gardens through careful assessment and selection of the soil, plants, etc. Before xeriscaping techniques could be employed at Cornell, more would need to be learned about xeriscaping in Iowa.
- **Process:**
 - Learn about the principles and processes of xeriscaping.
 - Use websites to ascertain whether or not xeriscaping has been used by any Iowan schools (or other organizations); contact those institutions.
 - If possible, conduct a cost analysis of a current xeriscaping program.
- **Implementation Idea:** Look into creating a pilot xeriscaped area at Cornell.

Conclusion

“We are caretakers not only for the Cornell of today and the next five years but for generations to come.” This statement concludes the Cornell College Strategic Goals for 2005-2009 and seems a fitting way to end my thesis.

The idea that we are caretakers for the future is the central tenet of sustainability. Waste reduction, environmental literacy, resource conservation, and pollution prevention are all vital components of sustainability, but the principle concept—the underlying theme and unifying goal—is the future. The mechanisms we implement and things that we do to live sustainably all function together to create a college, a household, a business, a farm, or a *planet* that will not only subsist but thrive for countless years to come.

When viewed with a long-term holistic perspective, it is clear that sustainability is not a choice, but a necessity. However, in modern America, it is too easy for the average individual to be oblivious to this fact: to drive an SUV, shop at Wall-Mart, set cans of trash on the sidewalk for curbside pick up, soak in hot baths, buy mangoes and pineapples in Iowa...all without thinking about the ramifications of these actions. We should be in awe of our planet and the lifestyles we force it to support, but, instead, we take them—and their infinite continuation—for granted. Even with climate change confirmed, the Colorado River running dry, violent tropical storms, polar bears on the brink of extinction, and countless other consequences of our modern, unsustainable lifestyle, there are individuals who are willing to speak out in favor of opulence and selfish consumption. Sadly, there are many more who are grateful for any excuse to ignore the inevitable and maintain the comfortable status quo for as long as possible.

The idea that our modern lifestyle will be able to persist indefinitely is dangerous, but the sustainability movement is up against common misconceptions, such as “conservation means doing without” and “green living is something hippies did in the ‘70s.” Yet, as I hope this report has demonstrated, a community can flourish both culturally and economically and still be sustainable. The success of this vision is contingent upon the way it is marketed to the mainstream consumer. The product of living for the future, of living in a sustainable manner, cannot be sold widely if it is packaged in an alternative environmental fashion; it can only be sold if it is packaged in a way in which all people can relate to it. Environmentally-minded individuals can recognize sustainability as ecologically sound, business-minded individuals can recognize it as economically sound, socially-minded people can recognize it as humane and, hopefully, all people can recognize it as critical to the future of humankind.

In regard to marketing and living this paradigm shift to sustainability, colleges and universities are in a unique position. They are institutions of great longevity, deference to tradition, and safeguards against the reckless and hasty. At the same time, they are centers for innovation and discovery. These two personalities of higher education can be at odds, as is demonstrated by their relationship with sustainability. The sustainability movement is asking educational institutions to employ their innovative capabilities to revolutionize modern lifestyles. It is asking them to do so by changing their stone-bound traditions of inter-departmental divides, disparities between academics and operations, and general inertia.

Colleges and universities also are in a unique position with regard to their power to influence the world through their operational decisions. Individuals can make their own decisions about sustainability, including what to buy, whether or not to compost and recycle, how often to drive, what energy plan to use, etc. Individuals living and working in an institutional environment, however, do not get to make these decisions. Instead, college students eat the food provided them, use the paper supplied in the printers, and live in dormitories built to college specifications. Faculty and staff members, too, work in

environments which they cannot control and follow policies they did not create. Consequently, the actions and habits of all college community members simply amplify the effects of institutional decisions. By choosing to become sustainable, an institution enables each of its community members to be sustainable too, and helps to create habits and higher degrees of ecological awareness which may translate into other areas of their individual lives.

Cornell has a history of rapid institutional change; if OCAAT can transform an overlooked Midwest institution into a “college that changes lives,” just think of the possibilities with an equally unique Cornell-style sustainability campaign. Cornell is in the position where it can decide to be bold and adopt the concept of sustainability as the central tenet of a campaign to unify the campus, save money and resources, and truly create community of caretakers who are committed to sustaining Cornell and the world not only for the present and for the next five years, but for many generations to come.

Resources and Works Cited

Organizations and Alliances

Alliance to Save Energy, Green Campus Program:

Green Campus newsletter archive, general resources and links.

<http://www.ase.org/section/program/greencampus>

Campus Consortium for Environmental Excellence:

A wide variety of resources, including the “2006 Benchmark Survey of the State of Environmental Management Systems at Colleges and Universities”

(http://www.c2e2.org/2006_EMS_Report.pdf). “A Practical Guide to Hiring a Sustainability Professional for Universities and Colleges” (http://www.c2e2.org/sustainability_guide.pdf). EPA Best Management Practices Catalog with information about initiatives which have been successful at many institutions (<http://www.c2e2.org/projects.htm>).

www.c2e2.org

Ceres, Investors and Environmentalists for Sustainable Prosperity:

List of the Ceres Principles, coalition members and Ceres Companies.

<http://www.ceres.org/coalitionandcompanies/principles.php>

Clean Air Cool Planet:

Campus Climate Action Toolkit with a green house gas inventory calculator; case studies and general information about global warming and alternative energy.

http://www.cleanair-coolplanet.org/for_campuses.php

International Institute for Sustainable Development:

Online “tool kit” for greening campuses. Includes examples of declarations and policies in place at institutions, case studies, and a large resource list of books and websites.

<http://www.iisd.org/educate/>

MPIRG (Minnesota Public Interest Research Group), The Green Campus:

Green Campus Listserve and discussion group.

<http://www.mpirg.org/greencampus/>

National Wildlife Federation Campus Ecology:

Resources for members and non-members; “year book” of sustainability initiatives, student fellowship opportunities, links to articles and websites.

www.nwf.org/campusecology

Sustainable Campus Information Center:

Information about a variety of topics relating to campus sustainability and links to many web resources.

www.sustainablecampus.org/universities.html

Sustainable Universities Initiative:

Resources include links to online ecological footprint calculators and issue-specific sites.

Information about sustainability initiatives at each of the 3 institutions in the consortium.

www.sc.edu/sustainableu/

University Leaders for a Sustainable Future, Talloires Declaration:

Text of the declaration, list of signatories, and information about the signing process. The ULSF website also has general information about campus sustainability, including articles and other resources.

www.ulsf.org/programs_talloires_td.html

World Changing, A User’s Guide for the 21st Century

Available in both book and website form; “a groundbreaking compendium of the most innovative solutions, ideas and inventions emerging today for building a sustainable, livable, prosperous future.” The information is divided into 7 sections: Stuff, Shelter, Cities, Community, Business, Politics and Planet; each section includes general information, articles, and links.

www.worldchanging.com

Colleges and Universities

Brown University, Brown is Green:

Program summary and reports (including student reports), links to outside resources.
http://www.brown.edu/Departments/Brown_Is_Green/

Cornell University, Sustainable Campus:

Information about sustainability in general, including a synthesis of definitions and their sources; links to many reports and articles; information about sustainability initiatives at Cornell.
<http://www.sustainablecampus.cornell.edu/>

Furman University, Year of the Environment:

Information about Year of the Environment Events, links to reports about their sustainability initiatives.
www.sustainanfurman.com

Harvard University, Green Campus Initiative:

<http://www.greencampus.harvard.edu/greenteams>

Oberlin College, Environmental Policy:

Policy statement and report.
www.oberlin.edu/presidnt/documents/epac.pdf

Penn State, Green Destiny:

www.bio.psu.edu/greendestiny/publications/gdc-indicators_2000.doc

University of Buffalo, UB Green:

Comprehensive website with policies, programs and general information.
<http://wings.buffalo.edu/ubgreen/index.htm>

University of California, Berkeley, 2005 Campus Sustainability Assessment:

Comprehensive environmental audit with background information and recommendations.
<http://sustainability.berkeley.edu/assessment.html>

University of Colorado at Boulder, Green Investment: Green Return:

Document describing the economic and environmental aspects of UCB's sustainability initiatives.
<http://ecenter.colorado.edu/publications/gigr.pdf>

University of Pennsylvania, Environmental Audit:

Detailed information about their environmental audit, including recommendations.
<http://dolphin.upenn.edu/~pennenv/audit/>

Yale Office of Sustainability:

Comprehensive sight with detailed information about the structure and programs of the Office, links to Yale reports on sustainability and other resources.
www.yale.edu/sustainability/

Books and Articles

Bartlett, P. and Chase, G. 2004. *Sustainability on campus: stories and strategies for change*. MIT Press. Cambridge, MA.

Chernushenko, D. 1996. *Greening campuses*. International Institute for Sustainable Development. Chronicle of Higher Education. Special Report. October 20th, 2006.

Creighton, S. 1998. *Greening the ivory tower: improving the environmental track record of universities, colleges and other institutions*. MIT Press Cambridge MA.

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Harvard University. 2002. Green campuses: the road from little victories to systemic transformation.
<http://www.greencampus.harvard.edu/greenteams/>

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http://www.bio.psu.edu/greendestiny/publications/gdc-indicators_2000.doc
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<http://www.uspartnership.org/>
- University Leaders for a Sustainable Future. Indicators of Sustainability.
<http://www.ulsf.org/publications.html>

Web-based Miscellanea

- Ceres Principles*, Coalition for Environmentally Responsible Economics:
<http://www.ceres.org/coalitionandcompanies/principles.php>
- Energy Action Coalition*, New Energy for Campuses:
 Document with case studies and resources on energy-saving policies for colleges and universities.
www.energyaction.net/documents/new_energy.pdf
- Fostering Sustainable Behavior*, McKenzie-Mohr and Associates:
 Online book about creating behavioral change relating to sustainability. Also includes articles and study reports which can be searched for by topic or by change tool.
www.cbsm.com
- Rand Corporation*:
 Online report, "Getting To Outcomes; Promoting Accountability Through Methods and Tools for Planning, Implementation, and Evaluation."
http://www.rand.org/pubs/technical_reports/TR101/index.html
 Dr. Abe Wandersman, co-author and University of South Carolina professor:
wandersman@sc.edu
- The Sustainability Advantage*:
 Online information (including experts and summaries) about two books, *The Sustainability Advantage* and *The Next Sustainability Wave*, both written by Bob Willard and aimed at businesses.
www.sustainabilityadvantage.com
- Sustainable Seattle*, Indicators of Sustainable Community Report:
<http://www.sustainableseattle.org/Programs/RegionalIndicators/1998IndicatorsRpt.pdf>

Audit Resources

- Campus Ecology: A Guide to Assessing Environmental Quality and Creating Strategies for Change*. April Smith and the Student Environmental Action Coalition. 1993. Living Planet Press. Lost Angeles.
- Sustainability Assessment Questionnaire for Colleges and Universities*. University Leaders for a Sustainable Future. 1999. www.ulsf.org/programs_saq.html

A) Buildings and Grounds

General Information

- Minnesota Sustainable Building Guidelines*:
www.sustainabledesignguide.umn.edu/
- University of California, Santa Barbara, Green Building Feasibility Study*:
<http://www.bren.ucsb.edu/about/GreenBren.pdf>

and (description): http://www.cbe.berkeley.edu/mixedmode/bren_hall.html

Us Green Building Council:

Information about LEED certification, including the certification process and reports about green building.

www.usgbc.org and www.usgbc.org/displaypage.aspx?cmspageID=75&#rs

Case Studies

Florida State University, Xeriscaping:

<http://livinggreen.ifas.ufl.edu/landscaping/xeriscaping.html>

Furman University:

www.sustainfurman.com

Oberlin College, Environmental Policy:

www.oberlin.edu/presidnt/documents/epac.pdf

Oberlin College, Resource Monitoring:

www.oberlin.edu/dormenergy/

University of Colorado, Integrated Pest Management Policy:

http://ecenter.colorado.edu/greening_cu/policies/ipm_policy.pdf

University of South Carolina, West Quad:

www.hrs.sc.edu/pdf/wqstory.pdf and www.housing.sc.edu/rli/westquad.asp

B) Dining Services

General Information

Bon Appetite Management Company

<http://www.bamco.com/website/home.html>

Earth Tub composting:

www.compostingtechnology.com/EarthTub/et-info.php

European Environmental Agency, "Household Consumption and the Environment:"

www.reports.eea.europa.eu/eea_report_2005_11/en/eea_report_11_2005.pdf

Lincoln Café:

www.foodisimportant.com

Sodexo USA

<http://www.sodexhousa.com/>

Vermicomposting:

www.musc.edu/recycle/WMPRIMER.pdf

www.dndwormranch.com

Case Studies

Colorado College:

www.coloradocollege.edu/ccdining/responsibility.asp

Grinnell College:

www.grinnell.edu/etal/green/diningservices/

Medical University of South Carolina, composting:

www.musc.edu/recycle/vermicompost.htm

University of Vermont, composting:

www.uvm.edu/%7euvmppd/services/recycling_and_solid_waste/?page=composting/composting.html

C) Energy

Background information

LED and LEC exit signs:

www.theexitstore.com

Alliant Energy:

www.alliantenergy.com

American College and University Presidents Climate Commitment:

www.presidentsclimatecommitment.org

VendingMiser:

www.vendinmiserstore.com

Case studie

Connecticut College, renewable energy:

<http://oak.conncoll.edu/~renergy/projects.html>

and www.conncoll.edu/ccrec/greenet/renewable%20energy%20policy.pdf

Unity College, renewable energy:

www.maine.greenpower.org/about/unity-2004-02.shtml

and www.unity.edu/sustainability/progress.htm

University of Vermont, VendingMiser:

www.uvm.edu/energy/?page=vendingm.html

University of Vermont, Energy Practices (including LED signs):

www.uvm.edu/energy/?page=energy%20efficiency%20projects.html

D) Purchasing

General Information

Green Seal:

www.greenseal.org

U.S. Environmental Protection Agency, Environmentally Preferable Purchasing:

<http://www.epa.gov/oppt/epp/index.htm>

Rutgers Solid Waste Policy Group:

<http://aesop.rutgers.edu/~envpurchase/>

Case Studies

University of Colorado:

<http://ecenter.colorado.edu/publications/gpg/index.html>

Villanova University:

http://www3.villanova.edu/environment/policies/green_purchasing.pdf

E) Transportation

General information

Azure Biodiesel Company:

www.azurebiodiesel.com

Environmental Transport Association:

www.eta.co.uk

National Biodiesel Board:

www.biodiesel.org

US EPA, Transportation and Air Quality:

www.epa.gov/otaq

Case Studies

Evergreen State University, parking lots:

www.psat.wa.gov/publications/LID_studies/permeable_pavement.htm#pp2

Furman University, alternative fuel:

www.biodiesel.environmentalactiongroup.org/FU_biodiesel.html

Oberlin College, car-sharing:

www.citywheelscleaveland.com/oberlin.php

F) Waste

General Information

Iowa DNR Waste Management:

www.iowadnr.com/waste/p2/index.html

US EPA Wastes:

www.epa.gov/osw

Case Studies

University of Colorado:

www.colorado.edu/cpi/whycpi.htm

Indiana University:

<http://kb.iu.edu/data/atvs.html>

G) Water

Background Information

US EPA Water:

www.epa.gov/waterhome

Rainwater harvesting and graywater recovery:

Innovative Water Solutions:

www.watercache.com

Oasis design:

www.oasisdesign.net

Case Studies

University of California, graywater system:

<http://www.bren.ucsb.edu/about/GreenBren.pdf>

University of Georgia, rain harvest system:

www.griffin.uga.edu/grif/dept/ageng/facilities.htm

H) Campus Structure and Outreach

General Information

The Sustainable Campus Information Center:

www.sustainablecampus.org

Case Studies

Carleton College, Sustainability Coordinator:

http://apps.carleton.edu/curricular/ents/assets/sustainability_coordinator_proposal_final.pdf

Clemson University, Environmental Committee:

www.clemson.edu/cuec

Colorado College, Sustainability Council:

www.coloradocollege.edu/sustainability/welcome.htm

Colorado College, mission statement:

www.coloradocollege.edu/welcome/mission/

Furman University, Strategic Plan:

www.furman.edu/planning/strategicplan/

Furman University, Year of the Environment:

www.sustainfurman.com

Tufts University, Ecoreps:

www.tufts.edu/tie/tci/ecoreps.html

University of South Carolina, Green Quad:

www.hrs.sc.edu/pdf/wqstory.pdf

University of Vermont, Ecoreps:

www.uvm.edu/~ecoreps/

Appendix 1:

Cornell Survey Results

For the purpose of gauging the interest and opinions of current Cornell community members regarding sustainability, faculty and staff and students were given separate surveys. The student survey was composed of five questions incorporated into the annual Residence Life survey. Approximately 40% of the student body participated in the survey. The faculty and staff survey included 20 questions. All faculty and staff members were invited to participate in the online survey and the total number of respondents was 117, 41% of the total.

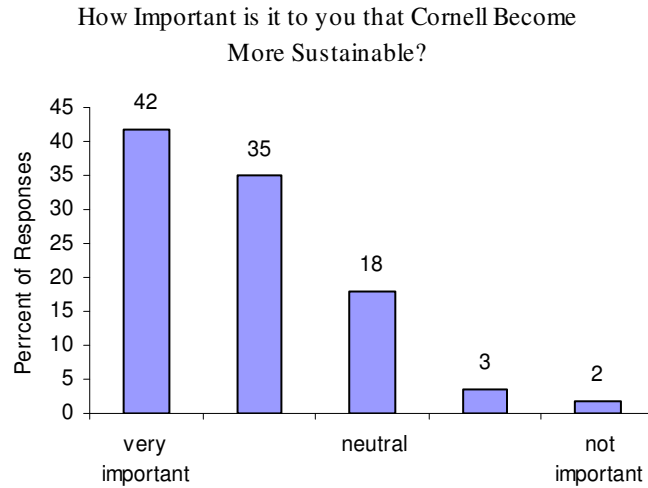


Figure 1: Faculty and Staff value of Cornell becoming sustainable

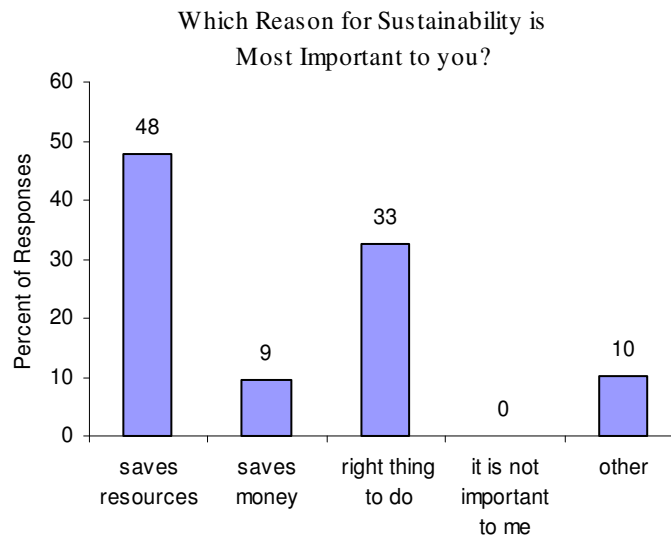


Figure 2: Faculty and Staff reasons for sustainability

How Interested are you in sustainability-themed programs?

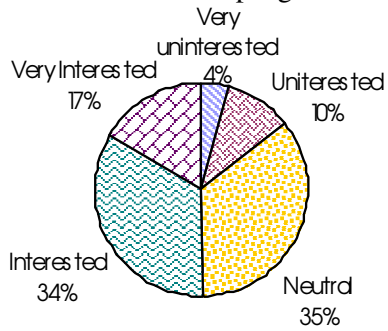


Figure 3: Student interest in sustainability programming

How Important is it to you that Cornell Adopt Green Building Practices?

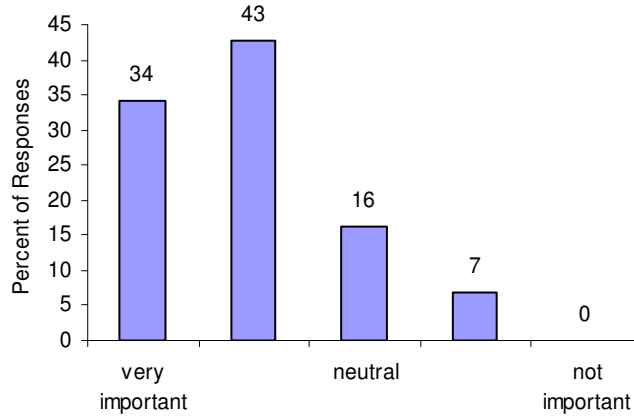


Figure 4: Faculty and Staff interest in Green Building Practices

To What Extent Would you Support an Extension of the Mission Statement to Include Sustainability?

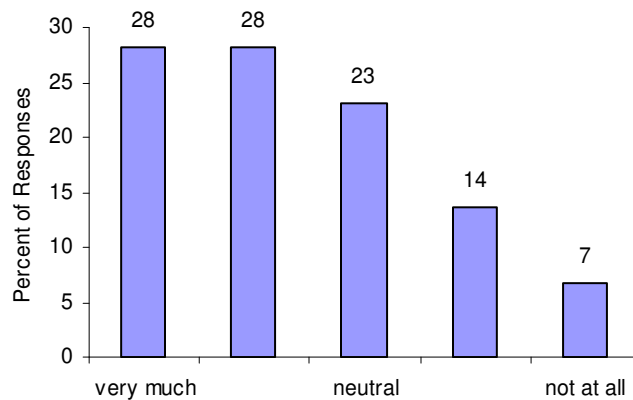


Figure 5: Faculty and Staff interest in sustainability and the College Mission Statement

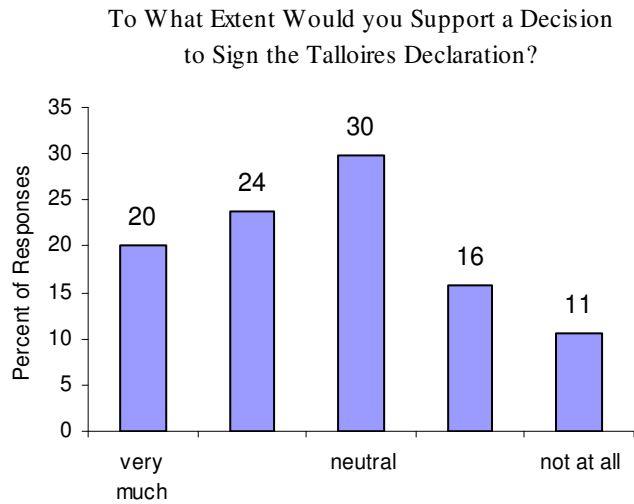


Figure 6: Faculty and Staff interest in the Talloires Declaration

How Interested are you in Sustainability?

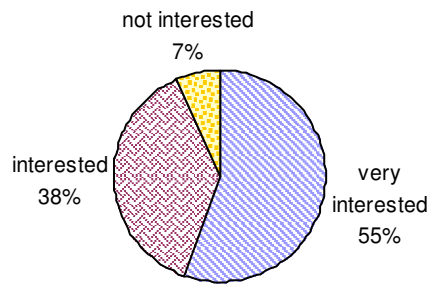


Figure 7: Faculty and Staff interest in sustainability

How Knowledgeable do you feel you
are About Sustainability?

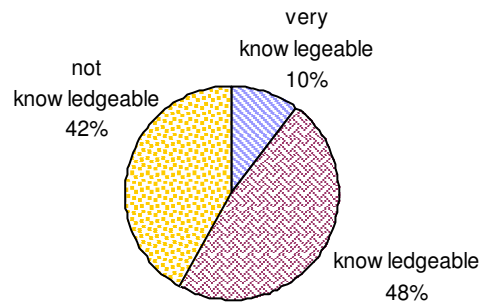


Figure 8: Faculty and Staff knowledge of sustainability

To What Extent Would you Support a Gen. Ed. Requirement Related to Sustainability?

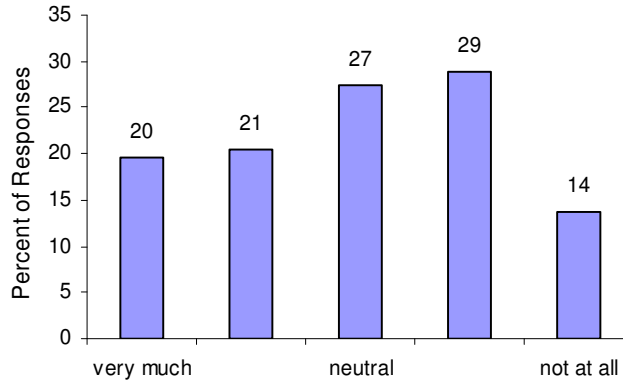


Figure 9: Faculty and Staff interest in sustainability General Education requirement

If you had a surplus \$1, How Would You Spend It?

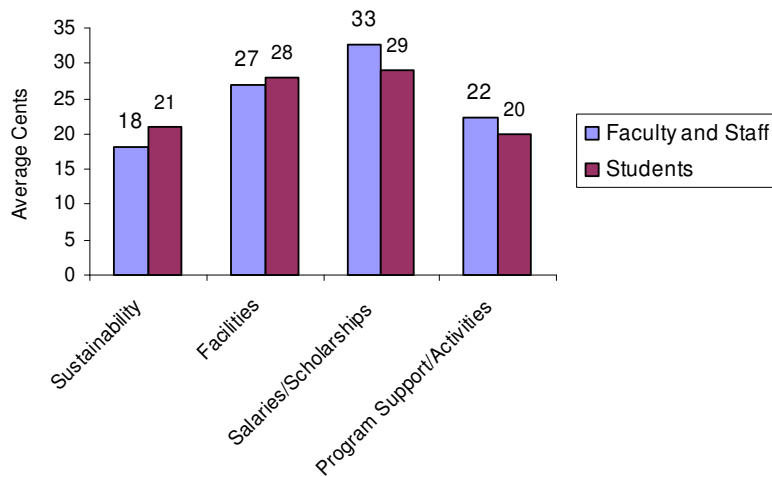


Figure 10: Faculty, Staff, and Students hypothetical spending

To What Extent Would you Support the Creation of a Permanent Committee?

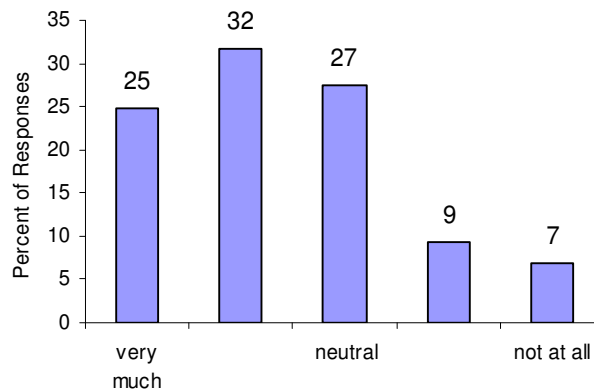


Figure 11: Faculty and Staff interest in sustainability committee

Would you be more Supportive of a Temporary Task Force?

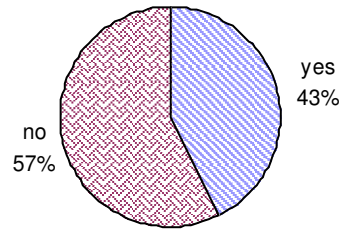


Figure 12: Faculty and Staff interest in temporary task force

Would you Volunteer to Serve on the Committee?

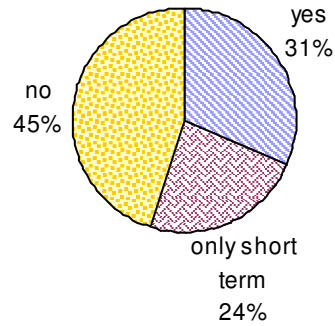


Figure 13: Faculty and Staff interest in committee membership

To what Extent Would you Support the Hiring of a Full-time Sustainability Staff Person?

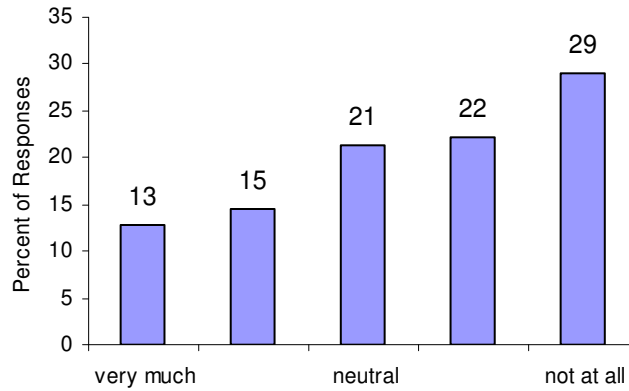


Figure 14: Faculty and Staff interest in sustainability staff position

How Interested are you in a Pay-for-Print System?

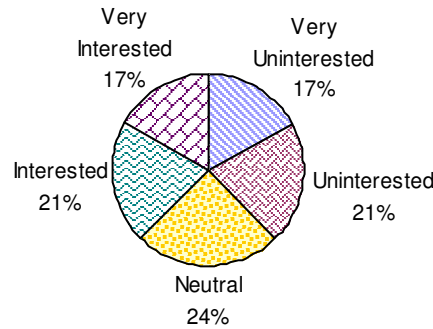


Figure 15: Student interest in pay-for-print

Table 1: Student Priorities; How would you rank the following categories (1 = most important)?

Category	Average Ranking	Most Popular Ranking
Recycling	2.8	2
Renewable Energy	2.5	1
Local/Organic Food	2.7	1
Water Conservation	3.3	4
Environmental Studies Program	4.0	5

Table 2: Faculty and Staff Priorities; How would you rank the following categories (1 = most important)?

Category	Average Ranking	Most Popular Ranking
Recycling	3.5	1
Renewable Energy	3.9	1
Water Conservation	5.2	4 and 7
Alternative Fuel	5.3	5
Environmental Studies Program	5.4	1
Green Building	5.5	5 and 9
Organic or Local Food	6.4	10
Pesticide and Fertilizer Use	6.7	9
Composting	7.0	10
Green Purchasing	9.5	6 and 7

Faculty and Staff comments about sustainability in the Cornell Mission Statement:

- “Sustainability should be an extension of all three of these [Mission goals]. It takes a leader to step up and make changes, service needs to be done to better the current standards, and global perspective should definitely include thinking about ways to save resources for our world.”
- “A global perspective can include sustainability, as we all affect the planet.”
- “In today’s world, leadership and global perspective go hand-in-hand with resource conservation and environmental awareness. We cannot emphasize one (let alone two) without the other.”
- “All three parts of the mission are linked directly to our responsibility to a more sustainable future. By becoming a leader in the sustainability revolution, Cornell would be showing that we are committed to this mission more than just academically.”

- *“If we are ‘educating’ students, but fail to educate them to be good stewards of our resources and models for forward thinking, then we are FAILING in our responsibility.”*

Faculty and Staff comments about funding sustainability:

- *“Although I am very supportive of sustainability principles, Cornell is not currently in a financial position to make a strong commitment to anything (new position, geothermal heat, etc.) that will increase costs significantly.”*
- *“This sounds terrific. I am 100% behind improving environmental practices at Cornell, however we must be realistic. This is a college that has many buildings on campus that are in such an advanced state of disrepair that I think the first step is to fix these problems - THEN think about improving things with sustainability.”*
- *“I think Cornell should move towards an eventual commitment such as that articulated by the Talloires Declaration, but I think the College needs to find a way out of its current budget crisis before it can do so.”*
- *“Understanding the current budgetary constraints of the college, I am in favor of the college proceeding to a more sustainability-conscious model so long as we take an incremental approach to implementation to ensure we are able to effectively support this initiative for the long term.”*
- *“Cornell is currently on a very, very tight budget with staff salaries being held at a minimum for a number of years. To the extent that it would further progress in this area I would be against the expense.”*
- *“I feel that sustainability is very important and could, potentially lead to great financial savings for the College. At present, however, there are many programs and staff salaries that are incredibly under-funded, and I feel that we need to better allocate money before instituting new programs or practices.”*
- *“The funding for a new staff position could likely be “recouped” in a very short period of time with the implementation of energy saving policies/programs (i.e. turning off computers at night).”*
- *“Spending resources now on improving long-term sustainability is ultimately a more efficient use of financial and natural resources. Basically - pay me now or pay me later!”*
- *“There are many ways to improve sustainability that do not involve increasing money spent. Obvious example: buying recycled products can actually save money. Likewise, investing in energy-saving lighting results in lower over-all costs. This is a “long-term” vs. “short-term” question. We need to think long-term in order to save money AND the environment.”*

Appendix 2:

Criteria for Indicators of Sustainability, Sustainable Seattle

In designing Environmental audits, care must be taken to ensure that the data being collected will be useful for setting goals and monitoring progress. These audit categories or “indicators” should be:

- *Relevant*
Tell something about the system that it is necessary to know.
- *Reflect Community Values*
Indicate community values and elicit reactions.
- *Attractive to local media*
Usable by the press to monitor and assess community trends.
- *Statistically Measurable*
Produce data that are measurable and comparable.
- *Logically or Scientifically Defensible*
Understandable rationales exist for using particular indicators and drawing particular conclusions.
- *Reliable*
Produce data that are consistent and trustworthy.
- *Leading*
Give information with enough time to act upon it.
- *Policy-relevant*
Informative for policy decisions.

Appendix 3:

Case Studies

A) Buildings and Grounds:

Green Quad at the University of South Carolina:

In 2004, students from the University of South Carolina moved into the university's first green residential complex. The West Quad is a four-building complex designed to be a "sustainable living environment," and includes three suite-style residential buildings and a "Learning Center for Sustainable Futures." The complex, which is certified LEED Silver, was created within the same budget and time frame as more traditional buildings.

Green features and practices that went into this complex include:

- Recycling 88% of the waste generated during the construction process.
- Using greater than 60% of construction materials which originated within a 500 mile radius of the school.
- Using recycled-content building materials when possible, including carpet with a 40% recycled content backing, and cement blocks containing recycled incinerator ash from a local coal plant.
- Using soil dug up during excavation as topsoil during landscaping.
- Maintaining internal air quality with a fresh-air input system and products with low-Volatile Organic Compound content.
- Placing "light shelves" on south-facing windows to reflect light in while reducing solar heating of the rooms.
- Pre-heating hot water through a solar heating system on the roofs of the buildings.
- Installing low-flow plumbing fixtures to reduce water consumption by 20%.
- Installing a 5-kilowatt hydrogen fuel cell to contribute power to the Learning Center.
- Creating a monitoring system of electricity use in student suites which can be accessed to view present and historical energy use.
- Adding a turf roof on top of the Learning Center to absorb heat and water and act as a small park.
- Employing xeriscaping techniques in the surrounding landscape to help limit runoff, reduce maintenance, and reduce pest and disease problems.
- Managing stormwater runoff through a tiered landscape system, which maximizes soil water absorption, and strategic creation of mini-wetlands.

The "greenness" of the quad was originally suggested to the Associate Vice President for Student Development and University Housing, Dr. Gene Luna, by the Dean of the School for the Environment. Dr. Luna was especially attracted to the potential for cost-savings and publicity and became immediately enthusiastic about the idea. The first LEED certified project in the area, the success of USC's Green Quad spurred a state-wide move toward green building, with responses from architects, contractors, manufacturers and other institutions. At the suggestion of Dr. Luna, USC has not made a commitment to LEED certification for all building projects, but rather to the LEED characteristics. The university will aim to achieve LEED-standard green features in all new buildings, but go through the labor-intensive process of LEED certification for only some of them. A project is in the works, however, for the USC Honors College complex, which is aimed at reaching LEED-gold.

A Living and Learning style Green Living Community will begin its pilot year in 2007-2008, with approximately 30 students on one floor of a West Quad dormitory participating in a sustainability-focused community. Students will take a 1 credit course on sustainability and receive academic credit for participating in a certain number of activities such as speakers, field trips, monthly community meals and projects. This community is based off of the EcoVillage model of intentional communities, such as the EcoVillage at Ithaca, in New York.

Eco-Cottage and Economic Green Building at Furman University:

An existing cottage-style campus housing unit was retrofitted with green features as an ongoing research project to help students "gain applied knowledge about alternative energy sources, recycling, sustainable

practices such as efficient appliances, and monitoring resource usage.” The cottage, which is 1400 square feet, holds 8 students and operates with low-flow shower heads, energy-efficient appliances, a resource-monitoring system, and a 2.4kilowatt solar-powered photovoltaic panel. The green features were built on volunteer labor, with donated funds.

The university has a cluster of similarly structured houses, and, although this is the only one that is currently green, a second retrofitting is planned for the near future. The non-green cottages act as a control group; the Eco-Cottage uses 70% less energy! The cottage and its residents are an active demonstration of sustainable living. During 2006-07, the students initiated spontaneous projects such as a clothesline and an organic garden which they fertilize with their own compost. The school is considering adding a themed freshman hall and a larger “language house” style eco-cottage as well.

As an incentive and a “thank you,” the eight students who live in the Eco-Cottage community have the opportunity to earn a \$1000 stipend by spending 3 to 4 hours per week on a sustainability-related activity.

In 2002, Furman University completed the first building with LEED Gold certification in the South-East. Hipp Hall, (departments of Education, Economics, and Business and Accounting) was also the university’s first green building, but all construction since then has been LEED Silver or greater. Hipp Hall’s green practices added about \$300,000 to the upfront cost, but the university expects to recoup the money within 12 year pay-back period, as a consequence of increased efficiency.

The university made its commitment to green building part-way through the design process for the Duke Library. Even with this constraint, the library, which is certified LEED Silver, was constructed below the budget that was created before the building went green.

Green Building Policy at Oberlin College:

Oberlin College has made a commitment to maximize LEED ratings of new campus buildings and renovations of current buildings. The school decided to adopt the standards created by the US Green Building council as opposed to creating their own campus-specific guidelines because the applicable technology is changing so quickly. Key staff members were trained on LEED to provide in-house support and knowledge.

The college felt that committing to 100% green building practices would be economically feasible because the operational costs on the buildings would be lower than in traditional buildings and because that such a commitment will likely appeal to potential donors and potential students.

Campus Resource Monitoring System at Oberlin College:

Oberlin College has installed resource monitoring systems in campus dormitories so that residents can use computers to check their real-time consumption of resources, namely electricity and water. Students can view their consumption in terms of quantity or cost. The system is used to collect data for research and also as a self-check incentive for energy-use competition between dorms. The idea is that high-performance, well-monitored buildings can become living demonstrations of how sustainable systems can work. The information will, ideally, help students regulate their resource use, and data are available for class projects.

Integrated Pest Management at the University of Colorado:

In 2002, UC Boulder issued a policy stating that “all unwanted pests will be managed by all persons (faculty, students, staff and applicators) utilizing the following Integrated Pest Management (IPM) procedures.” An IPM is defined in the policy as “an effective and environmentally sensitive approach to pest management that relies on a combination of commonsense practices” including “information on the

life cycles of pests and their interactions with the environment.” With this information in mind, pest management decisions reflect the “most economical means, and with the least possible hazard to people, prosperity and the environment.” Integrated Pest Management systems can also save money by reducing the amount of chemical pesticides that are used.

Xeriscaping at Florida State University:

Landscaping and water conservation can be compatible with the use of xeriscaping techniques. Xeriscaping, or dry gardening, “describes the practice of utilizing sound horticultural practices coupled with a common-sense approach to landscaping and resource use.” Xeriscaping is built around seven principles: proper planning and design; soil analysis and improvement; drought-tolerant plants; drought-tolerant turf; efficient irrigation; use of mulches; maintenance.

Because xeriscaped landscapes are designed to require fewer resources than traditional landscapes, benefits include reduced cost of water and labor. They can also provide educational opportunities for students and community members.

B) Dining Services:

Local, Organic Food at Grinnell College:

At present, locally grown food items used in the Grinnell Dining facilities include eggs, vegan egg-replacement, milk, herbs, tofu, yogurt, tempeh, pork, pasta, honey, bleu cheese, and some fresh fruits and vegetables. The flour used for baking is organic and the coffee served is shade-grown, fair-trade organic. During the 2006-2007 academic year, a student independent group project is investigating options for extending the local and organic food use in the Grinnell dining services.

Composting at Colorado College:

In 2003, a composting project was initiated at Colorado College, with a team of key people from Sodexo meeting with interested students. The group decided to purchase an Earth Tub for on-campus composting. A grant was awarded to help off-set the costs and the tub was installed during the summer of 2004. The compost produced by the operation has been used for on-campus gardening.

The Earth Tub is a self-contained unit in which 40 to 500 pounds per day of food scraps or yard waste can be broken down into low-volume organic material within a 3-4 week period. Compostable materials include all kitchen and table waste, including meats and fatty foods as long as they are added in small pieces and are kept to below 10% of the total input. The material must be mixed (by turning the rotating cover attached to a mixing auger) at least twice a week and liquid discharge must be collected and disposed of in a sewer or holding tank. In cold regions, an external heating system may need to be installed in order for composting to continue year round.

Vermicomposting at the Medical University of South Carolina:

Since 1999, the MUSC has been using vermicomposting to compost food waste from the main hospital cafeteria. They have a large-scale system which can handle continuous input of large amounts of food waste.

Vermicomposting uses worms to quickly break down organic matter and produce a rich product called “worm castings” which is valuable as a fertilizer. The food is composted when the worms eat and process it through their digestive system.

The set-up for vermicomposting is fairly simple; it can take place in a container made of wood or plastic and the bins can be located either indoors or outdoors, depending on the temperature. The initial filler of the bin is “bedding” material, and this is always used to bury food additions. Bedding materials can include shredded paper or cardboard, shredded dry leaves, chopped straw, sawdust, dried grass clippings and corn husks. Worms can compost any fruit or vegetable waste, even orange peels and tea bags, but

should not be fed meats, dairy products, eggs or oily foods. Because of this, the food-waste must be pre-sorted.

Residence Hall Composting at the University of Vermont:

UVM composts food waste by collecting waste at several locations each weekday and taking it to a non-profit composting facility located near the campus. At the facility, food waste and yard waste are layered in long “windrows” where they are mixed periodically and, ultimately, the product is used for gardening.

In response to student request, a pilot program has begun for residence-hall composting. Interested students can get a small plastic tub (used yogurt container) in which they can put personal food waste. The students are responsible for emptying their containers at existing compost collection sites around campus.

C) Energy:

Renewable Energy at Unity College:

In 2002, the college committed to purchasing 60% of its electricity from renewable sources and, in 2003, Unity College became one of the first institutions in the country to purchase 100% renewable energy. The college decided to work with Maine Green Power, which has a variety of green options including wind, solar, hydropower, biomass and Renewable Energy Certificates. The college also has a small (1KWH) student-build wind turbine which serves primarily educational purposes. In addition to Unity, several other schools have gone 100% renewable energy, including Western Washington University, College of the Atlantic, Colby College, and Concordia University, among others.

Renewable Energy at Connecticut College:

In 2001, the student body of Connecticut College voted to add \$25 per person to the yearly student fees to promote renewable energy. In its entirety, this sum of money must be used by the college to purchase renewable energy. The Environmental Model Committee proposes, each year, exactly how the money should be spent, i.e. to purchase renewable energy directly from a production source (such as a wind farm), to purchase it through a utility, or to purchase Tradable Renewable Certificates. The final decision is made by the Student Government. At this time, 50% of the energy required by the college is purchased from renewable sources. The college also installed a 10 kW solar panel system on the roof of one dormitory in 1999. The energy produced from the array offsets the power required by a new, efficient boiler system that was installed the same year. The combined savings of the boiler and the solar array are approximately equivalent to the amount of electricity used by one dorm in one academic year.

Vending Miser at the University of Vermont:

To reduce the amount of energy consumed by vending machines—and the amount of money spent on this energy—UVM installed “VendingMisers” on their machines. VendingMisers reduce the amount of time that a machine is illuminated and using energy to keep drinks cold.

A motion sensor causes the machine to light up when a person walks within 25 feet of it, and remain lit until there has been no activity for 15 minutes. Once the machine is dark, the cooling device also turns off, but the machine self-regulates its temperature every three hours to keep drinks chilled. In one year, one VendingMiser can reduce greenhouse emissions by 2,200 pounds of CO₂.

LED exit signs at the University of Vermont:

During the 2003-2004 school year, all campus exit signs were replaced with energy-efficient LED signs. This is an especially economically beneficial decision because exit signs are required to run 24 hours a day, 365 days a year. Different levels of exit sign efficiency can be purchased: UVM’s first batch of

LED (Light Emitting Diode) signs cost approximately \$50.00 each, and use 2 watts of electricity, but the university has committed to purchasing the even more efficient \$100.00 ¼ watt LEC (Light Emitting Capacitor) signs for all new buildings.

D) Purchasing:

Green Purchasing Policy at Villanova University:

The Green Purchasing Policy, which was adopted in 2001, was drafted by a committee of the Villanova Quality Improvement initiative and is carried out through the Procurement Office. The policy defines Green Purchasing as the

“practice of purchasing products and services that are less harmful to the environment-land, air, water-and all species that depend upon the environment for survival (including humans). Greener products are those that are made with less harmful materials or which are produced with minimal impact to the environment”

The policy dictates the procedure to purchase materials that are:

- Durable, as opposed to single use or disposable items.
- Non toxic or minimally toxic, preferably biodegradable.
- Highly energy efficient.
- Recyclable, but if not recyclable, may be disposed of safely.
- Made from raw materials which have been obtained in an environmentally sound, sustainable manner.
- Manufactured in an environmentally sound manner.
- Causing minimal or no environmental damage during normal use or maintenance.
- Shipped with minimal packaging (consistent with care of the product), preferably made of recycled and or recyclable materials.

E) Transportation:

Car-sharing at Oberlin College:

In Feb, 2006, Oberlin began a car-sharing program in which students, faculty, staff and community members may purchase membership to a program which allows them to rent one of the two cars which are available at Oberlin for this purpose. The cars are a Toyota Prius gas-electric hybrid and a Toyota Scion, a highly fuel efficient car. The program is coordinated through CityWheels, a car-sharing organization which is based out of Cleveland, and Oberlin’s Environmental Policy Implementation Group.

Members, who must be 21 years or older and have a clean driving record, can rent the vehicles for \$8.90 per hour, which includes gas, insurance, and maintenance. Membership may be purchased with a \$25.00 application fee plus a \$50.00 annual fee. For the program kickoff, the first annual fee was waived and free driving hours were granted to the first 100 students to sign up.

Parking Lots Modification at Evergreen State University:

To reduce the environmental impact of creating additional parking space at Evergreen State, a Parking Lots Modification project was conceived to expand the capacity of existing lots while decreasing the amount of water runoff and the need for designated water retention areas.

Pervious pavement is a structural variety of concrete that is formed by removing the fine particles to create large voids which allow water to percolate through rather than run off. This material will be used in the newly-paved surfaces and for re-surfacing existing lots. The price of the permeable pavement is comparable to traditional concrete pavement.

Alternative Fuel at Furman University:

The campus has purchased 30 electric vehicles. For on-campus use by Facilities Services, 35 electric golf carts were purchased to replace 31 gas cars and trucks. The golf-carts are cheaper to operate and take up less space. Campus Safety has also purchased one hybrid car.

A biodiesel project was initiated by a faculty member and is carried out as a joint initiative between faculty and a student environmental organization. The project takes used vegetable oil from the university cafeteria and uses it to produce biodiesel. The goal of the project is to produce 50% of the diesel needed by the University's physical plant, and to sell the fuel to Facilities for use in lawn mowers, tractors, and trucks. Benefits of the project include the recycling of the waste oil, the reduction of diesel purchases and the reduction of green-house gas emissions from university machinery.

Grinnell College also has a program to convert waste vegetable into Biodiesel, but the conversion occurs at the Azure Biodiesel Company in Sully, Iowa.

F) Waste:

Waste-reduction through pay-for-print:

The University of Colorado, Boulder and Indiana University at Bloomington have each started pay-for-print programs in which students pay for individual prints and copies that they make on campus machines. Previously, students had a portion of their obligatory student fee go toward a blanket printing privilege. The universities noticed that many students had highly wasteful printing practices. To implement this program, UC Boulder preloaded each student ID card with a \$10 student printing fee. As prints were made, 10 cents were deducted for each single-sided print, 9 cents for the second side, and 50 cents for a color print. When necessary, the students could re-charge their cards at pay stations.

The success of these programs has been incredible. UC Boulder found that the program reduced printing by about 70% in the first six months, thus eliminating approximately 12.5 million prints each year. Environmental and economic benefits include the reduction in paper use and electricity, as well as ink, toner and general printer maintenance. The University of Indiana also found that the program was fairer for students, as they only paid for the prints they actually made.

According to the student sustainability survey conducted for this report, 24% of the Cornell students surveyed were neutral regarding the idea of pay-for-print, while the rest of the students were split evenly for or against the idea (Appendix 1 figure 15).

G) Water:

Rain Harvest System at the University of Georgia:

Rain which falls on the roof of the Griffith Building at UGA is channeled through a gutter system and into a catchment tank. During an average rainfall, about 2/3rds of a gallon are collected for every square foot of roof. The system also catches condensation from the building's air-conditioning units and could be connected to refrigerator or freezer drains. During large rain events, an overflow valve in the tank opens, allowing water to flow to a strategically-placed "rain garden" of low-set hydrophilic plants. The water in the tank is used for watering campus gardens and could be connected to lawn or sport field irrigation.

Graywater System at the University of California Santa Barbara:

The University's Donald Bren Hall, School of Environmental Science and Management, was completed in 2002 as the country's first LEED-platinum laboratory building. Included in the building's green features are a graywater system for toilets and irrigation.

Graywater is waste water that has been used once but that can be used again for purposes which do not require potable water, such as flushing toilets and irrigation. Sources of graywater include sinks, showers and washing machines. Using graywater in place of freshwater greatly reduces the consumption—and the cost—of freshwater and also puts less strain on septic tanks and treatment plants.

In Donald Bren Hall, reclaimed graywater is used for toilets and urinals. Because this system requires additional pipes and pumps, it can only be implemented during initial construction of a building. The university found that it would cost \$12,000 to implement this graywater system throughout the entire laboratory, but that the cost would be repaid through reduced water consumption. Irrigation of the grounds around the building also uses graywater.

H) Structure and Opportunities:

Mission Statement at Colorado College:

The college mission statement itself includes sustainability and related ideas in its list of core values. The statement reads: “as members of the Colorado College community, we share a commitment to:

- Honor the life of the mind as the central focus of our common endeavor.
- Value all persons and seek to learn from their diverse experiences and perspectives.
- Practice intellectual honesty and live with integrity.
- **Serve as stewards of the traditions and resources** of Colorado College.
- **Nurture a sense of place and an ethic of environmental sustainability.**
- **Encourage engagement and social responsibility at local, national, and global levels.**
- Seek excellence, constantly assessing our policies and programs.”

Strategic Plan at Furman University:

Sustainability was introduced as a key theme in the university’s 1997 Strategic Plan, and was emphasized even further in the 2004 update. The initiatives of Furman’s 2004-2006 Strategic Plan are to: Enrich the Intellectual Climate; Support Development of Students, Faculty and Staff; Enhance Awareness of Environmental Sustainability; Serve the Greater Community. For the sustainability initiative, the strategic plan reads:

The Furman community is passionate about preserving the environment...Students and faculty have demonstrated this commitment on campus and in the community, frequently in collaboration with neighboring organizations, to reduce our footprint on the earth and live environmentally sustainable lives. With environmental responsiveness instilled deep in its philosophy, the university serves as a caretaker of the community.

Furman students find that personal responsibility toward the environment is very much in harmony with the university’s cooperative spirit and fundamental approach to engaged learning. Like the habits of intellectual curiosity and creativity, students come away from the Furman experience with the habit of environmental citizenship as a way of life.

Goals under this initiative include:

Environmental Commitment

- Ensure the curriculum reflects Furman’s commitment to sustainability.
- Initiate a co-curricular plan for sustainability.
- Conduct a comprehensive environmental audit.

Environmental Planning

- Appoint a sustainability coordinator.
- Work with local agencies to protect and enhance the environment surrounding Furman.
- Form an environmental action committee.

Sustainability Mission Statement at Northland College:

Although the Northland College mission statement does include sustainability, the college also has a separate a mission statement which goes into much detail and specifically addresses the college's position on sustainability and outlines the types of policies and procedures the college should endorse. The first two paragraphs of the statement read as follows:

“Northland College appreciates and respects the interdependence of complex human and ecological systems and is committed to maintaining and improving their health, wholeness, balance and diversity.

As a leader in the environmental field, the College will support programs and policies which reduce the demands upon the environment to a point below the earth's regeneration rate and actively pursue the ultimate goal of a sustainable campus.”

The body of the mission is composed of single-sentence descriptions of the types of policies which the college will endorse. The statement ends with:

“Northland College and the Northland College community will strive to be a leader in the continuous pursuit of sustainability by experimentation, monitoring, education and outreach.”

Sustainability Coordinator at Carleton College:

Carleton College currently has an Environmental Sciences student intern, an Environmental Advisory Committee and an Environmental Statement of Principles. With only this structure, however, the College is finding it difficult to implement a comprehensive sustainability initiative. In 2005, a proposal was drafted to create two new positions: a sustainability coordinator and a sustainability intern.

The Sustainability Coordinator is a “full time position that serves as an expert and resource for all areas, including academics, facilities, dining services and college culture, in order to establish Carleton as a national figure in sustainability.” The coordinator will report directly to the College President. The Sustainability Intern will report to and assist the coordinator.

(For more information, see section titled *Organizational Structure*)

Environmental Committee at Clemson University:

Clemson has set up a committee to oversee the University's sustainability initiatives. The committee is permanent; because sustainability is a never-ending issue, re-evaluating goals and progress will always be pertinent and necessary for further progress to be achieved. Under the general committee are several project-oriented task forces which emerge and recede as projects begin and end.

The purpose of the Environmental committee is:

- To **formalize** within Clemson University's **mission** the concepts of environmental stewardship and sustainability,
- To **minimize** adverse **impacts** and consumption of material and energy for environmental and economic reasons,
- To **seek** and **coordinate** comprehensive **information** on which to base reasonable and effective conservation, recycling and environmental programs and policies,
- To **integrate** fragmented **programs** and **policies** that already exist,
- To provide a **mechanism** for environmental **education** of students, staff, and faculty,
- To **promote learning** and research, and
- To establish Clemson University as a **national leader** in incorporating environmental principles into campus **operations** and design.

The chair position is rotated on a two-year basis. The Committee is composed of 24 individuals, including faculty, staff, and administrators from a variety of university divisions (including athletics and the library) and student representatives.

Sustainability Council at Colorado College:

With the smaller scale of the liberal arts college, the members which are appointed to the Sustainability Council by the president of Colorado College include a chair, two faculty reps, six staff reps, five student reps, one member of the board of trustees, one non-college affiliated community member and an ex member.

Eco-Fund at Colorado College:

The fund provides a “means by which individuals (alone or in groups) can design and implement initiatives that improve the environmental impacts of the college.” Applicants submit written proposals to the Sustainability Council. The Council looks for innovative, thoughtful ideas and judges the proposals based on:

- Faculty or Staff Endorsement
- Significant vs. symbolic action
- Benefit to CC beyond cost
- Time frame for accomplishment
- Demonstrated ability of applicant(s) to carry out project
- Rigor with which application has been prepared
- Amount of funding requested is reasonable given proposed project
- Rationale for project is compelling

In a given academic year, one or several grants may be given by the Sustainability Council from a pool of at least \$2,500.

Eco-Rep at the University of Vermont:

To repair the disconnect between institutional policies and campus residential living, an Eco-Rep program was created in 2004. One student Eco-Rep is hired per dormitory, and these students act as the contact person and coordinator for sustainability-related initiatives in their residence hall. The Eco-Reps must participate in an orientation session at which they receive a training manual, and must participate in biweekly planning meetings. The reps help encourage recycling and energy conservation in their halls, publish an Eco-Mind column in the student paper, and host other programs and events such as converting incandescent bulbs to fluorescent bulbs in residence halls, monthly environmentally-themed film nights, energy use audits of dorm rooms and trash assessments.

The students are hired either as temporary employees within Residence Life or as work-study students through the Physical Plant, and each rep is paid for 4 hours per week. UVM found that paying the students was worthwhile because it ensures accountability and reliability. A grad student was hired as the Eco-Reps coordinator. UVM modeled their program on similar initiatives at Tufts University and Harvard University, but comparable programs now exist at over a dozen institutions. At many of the schools, such as Connecticut College, the Eco-reps are also required to participate in their Hall Councils.

Sustainability Awards at Colorado College:

To recognize individuals who have worked to make a difference in sustainability, the Sustainability Council gives three Sustainability Awards during Earth Week each year. The Council encourages community members to nominate individuals to compete for the award. From the nominees, the council gives recognition to one student, one faculty member, and one staff member. The recipients are

individuals who have made “contributions to the campus, local, regional, or global environment.” Each awardee is given a prize of \$250.

Green Bucks at the University of South Carolina:

Residents of the West Quad LEED-Silver dormitory complex can participate in the Green Bucks program to earn raffle tickets for an end-of-the-year drawing for prizes such as an Energy Star DVD player and gift certificates. Students can earn bucks by: learning about sustainability through attending lectures or conducting class projects, following sustainability practices in their rooms such as keeping the temperature at a reasonable level, contributing to projects such as planting gardens or recycling at sport events, acting in a leadership role such as planning a hall event.

Year of the Environment at Furman University:

To bring the topic of sustainability to the attention of the entire university community, the President of Furman University declared the 2006-2007 academic year the “Year of the Environment.” The goal was to “to entangle promoting our environmental accomplishments with cultivating more environmentally sustainable behaviors within our constituents.” Events of the year include:

- Opening convocation address emphasizing sustainability.
- Kill-A-Watt challenge among students to reduce energy and increase recycling.
- Eco-Contract agreement to conserve energy and recycle. Kickoff with a raffle (top prize of a tv), open to students who signed contract.
- eArTh: Environmental Art contest for which students may submit any 3-d or 2-d piece that has a theme relating to nature, conservation, recycling, reuse, etc.
- Campus-wide sustainability initiatives; website highlighting what has been done and is in the process of being completed.
- Series of speakers, documentary videos, panel discussion, opportunities to attend conferences, campus sustainability day, and other environmentally-themed events.

Appendix 4:

Audit Questions

A) Campus Buildings and Grounds:

Buildings:

1. What are the current plans for expansion and renovation at Cornell?
2. Do any of these plans include environmental considerations?
3. Does Cornell have an ongoing planning committee?
4. Is Cornell exempt from any land-use planning and zoning laws?
5. Have any buildings been built following environmental design or practices?
6. Have any buildings been renovated following environmental design or practices?
7. What type of system does Cornell use for heating and cooling its buildings?
8. What are the annual costs of heating and cooling the campus?
9. Is there a set procedure for temperature control and use?
10. Does this procedure include lowering the temperature when buildings are not in high use (i.e., at night and during breaks)

Grounds:

1. How much land is owned by Cornell?
2. Is there a long-range development plan describing existing and future land uses?
3. Does the document contain environmental criteria?
4. Are any efforts in place to retain/restore native habitats or use native vegetation in landscaping?
5. What type of fertilizer is used on campus and in what quantity per year?

Pest Control:

1. What pesticides are used on campus and in what quantities?
2. How has this changed over the past five years?
3. What kinds of pests are they controlling and where?
4. What are the total costs for contracts and purchases related to pest control?
5. How have these costs changed over the past five years?
6. Has Cornell initiated an Integrated Pest Management Program?

B) Dining Services:

1. Who operates the Cornell food service?
2. Does the Cornell administration manage the operation or do they contract for services?
3. Does Cornell have a food-service committee?
4. To what extent does food services purchase from regional growers and food processors?
5. Does Cornell purchase organically-grown produce, meat or dairy products?
6. What happens to the left over food and other food waste?
7. How much food waste is generated in one academic year?
8. What is the associated cost with disposing of this food waste?

C) Energy:

Electricity:

1. Through what utility does Cornell purchase its electricity?
2. What are the sources of energy for the electric utility serving Cornell?
3. How much energy did campus buildings and grounds consume in the last academic year and what were the costs associated with each type of fuel?
4. How has campus energy use changed over the past five years?
5. Does Cornell have an energy-efficiency program?
6. Is energy efficiency a consideration when purchasing new equipment?

Indoor and outdoor lights

1. Are any lights left on all of the time?
2. Are lights shut off at end of day and on weekends?
3. Are lights as efficient as they could be (ie, using 40w rather than 100w?)
4. Is the arrangement of lights efficient?
5. Are fluorescent lights used rather than incandescent lights?
6. Do exit signs use LEDs?

D) Purchasing:

1. Does Cornell have a policy of preferentially buying products - such as paper products, building materials, oil, and tires - made from recycled materials instead of virgin materials?
2. Have any programs been established at Cornell to promote the use of ecologically sound products (such as organic produce, compact fluorescent bulbs, non-toxic cleaning products?)
3. What recycled materials are purchased by the College?
4. What energy efficient products and equipment is purchased by the College?
5. Does Cornell use any environmentally sound construction materials?
6. What types of janitorial supplies does Cornell use?
7. How many reams or tons of high-grade writing paper and copy paper does Cornell purchase annually?
8. What percentage used is made of recycled materials?
9. What is the associated cost?

E) Transportation:

1. How do off-campus students, faculty, staff and administration get to campus every day?
2. What are the estimated percentages by each mode? (Single-occupancy car, bicycle, carpool, walking.)
3. Approximately how many vehicles travel to campus daily?
4. Does Cornell have a program to promote ride-sharing? (e.g. carpool, matching services, preferential parking, reduced parking rates, subsidized vanpools)
5. How far do people commute on average?
6. What percentage of Cornell's campus area is devoted to roads and parking lots?
7. Does Cornell have enough parking to meet the demand?
8. Is it campus policy to provide parking to meet demand?
9. Are students, staff, and faculty charged for parking? How much?

F) Waste:

Solid Waste:

1. How much total solid waste does the campus generate annually?
2. Have any waste-composition studies been conducted?
3. For the past year, how much solid waste was: Landfilled? Incinerated? Recycled? Composted? Mulched?
4. What were the costs of solid-waste disposal for the last academic year?
5. How have they changed over the past five years?
6. Does Cornell have a recycling program?
7. When was it started and who operates the program?
8. Are there any regulations relevant to the recycling program?
9. What is the budget for the program? How is it funded? What are the revenues from recyclables sold?
10. How many tons of each material were recycled during the last academic year? newsprint, glass, white ledger/computer paper/, mixed color paper, aluminum, other metals, cardboard, plastic
11. Please describe any programs Cornell has implemented to promote source reduction (such as a reusable mug program, switching from disposable to washable dishes)

Hazardous Waste:

1. What kind of hazardous waste does Cornell generate and what are the sources?
2. How much hazardous waste does Cornell generate annually?
3. How has this figure changed over the past five years?
4. How is this waste disposed?
5. How much is recycled, incinerated or landfilled?
6. What were the total hazardous-waste disposal costs for the last academic year?
7. How have these costs changed over the last five years?
8. What is being done to minimize the quantity of hazardous substances used and waste generated?
9. Have any microscale chemistry techniques/surplus chemical exchange programs been initiated?
10. If the Chemistry Department has implemented a microscale laboratory program, how many courses use microscale techniques and how many students does this include?
11. Roughly what portion of the chemistry program does this represent?
12. Does Cornell have system for tracking and inventory of hazardous chemicals bought and used?

G) Water:

Input and Conservation:

1. Where does Cornell's water supply originate?
2. Where is campus water treated?
3. What kind of treatment does it receive?
4. How much water did the college consume last year?
5. What was per capita water consumption in the last year?
6. What were the water utility costs for the college for the past year?
7. How have these costs changed over the past five years and why?
8. How has this figure changed over the past five years?
9. What percentage of water is used indoors as compared to outdoors?
10. How does Cornell manage its outdoor water usage?
11. Does the campus have a water conservation program?
12. If so, what measures does it include?
13. Are there any estimates of water savings from such programs?

Wastewater and Storm Runoff:

1. How much wastewater (sewage) does your campus generate annually?
2. Where is campus wastewater treated?
3. What kind of treatment does it receive?
4. What costs, if any, are associated with treating campus wastewater?
5. What percentage of the community's wastewater treatment facility is used to process campus-generated wastewater?
6. Where is this treated wastewater discharged?
7. Has Cornell initiated any programs to reduce wastewater volume and/or toxicity?
8. Does Cornell use any reclaimed water in its facilities or on landscaping?
9. What is the source of this water?
10. Is campus storm water runoff treated, or does it flow directly to a body of water?

H) Structure and Opportunities:

Administration, Faculty and Staff Opportunities:

1. To what extent do the formal written statements describing the purposes and objectives of the college as a whole and departments within it reflect a commitment to sustainability? (statements include planning documents, annual reports, brochures, catalogues, etc)
2. Do any environmental literacy programs exist on campus to train faculty (to incorporate environmental themes into their curricula) or staff (to incorporate into their procedures)?
3. Do criteria for hiring or promotion recognize faculty or staff member contributions to sustainability (in scholarship, teaching, or campus and community activities?)
4. Is any faculty research or scholarship being done on any sustainability related topic?
5. What percent of faculty teach or conduct research on topics related to the environment or sustainability?
6. To what extent is Cornell involved with sustainable community work or partnerships at local, regional, national or international levels?

Student Opportunities:

1. Please describe the environmental studies program at Cornell.
2. When was it created?
3. What is the annual budget?
4. What is the current enrollment?
5. What courses are offered with general environmental or sustainability themes?
6. Do any classes include study or research of campus sustainability issues?
7. Have any student projects been conducted on campus sustainability issues?
8. Is sustainability woven into and traditional disciplinary classes (ie, science, math, literature, history, etc?)
9. Are students required to take a course on issues related to the environment or sustainability?
10. Are there opportunities for community service, service learning or internships related to sustainability?
11. Does Career Services offer information on environmentally-oriented jobs?

Appendix 5:

Roles for the Community

President

- Create the overall tone and sense of priority
- Lead by example
- Set policies

Sustainability Coordinator (proposed role and position)

- Chair Committee
- Act as liaison between all community members
- Oversee all efforts

Committee (proposed role)

- Draft sustainability mission statement
- Draft policies
- Conduct environmental audits
- Brainstorm programs

Other Administrators

- Lead by example
- Convey sense of priority
- Network with peer institutions

Outreach Staff

- Change behaviors
- Generate external and internal publicity
- Market to prospective students

Operational Staff

- Implement policies
- Change procedures and behaviors
- Carry out changes in physical infrastructure

Academic Staff and Faculty

- Change behaviors
- Incorporate into classes
- Gather information

Student Life Staff

- Facilitate behavioral change
- Change behaviors
- Give recognitions and incentives

Students

- Change behaviors
- Initiate further change
- Network with other student groups

Appendix 6:

Sustainability Program Cost Analysis

The following analysis of actual and potential cost savings through sustainability programs is from Carleton College's 2005 proposal for hiring a sustainability coordinator and intern.

Financial self-interest: Carleton will benefit financially by being a sustainable campus. Given dramatic increases in energy costs, failing to become an environmentally sustainable institution is fiscally irresponsible.

-The University of British Columbia breaks down their savings since the establishment of their Office of Sustainability as follows:

UBC savings as of April 1, 1999 to Nov 11, 2005:

-52,526,774 sheets of paper saved (at Carleton's rate of \$4 per ream of 500 sheets, this is \$420,214 in paper savings alone)

-65,219,431 kWh of electricity saved (at Carleton's rate of .053 cents per kWh, this is \$3,456,630 in electric use)

-31,178 tons of greenhouse gas emissions reduced (at the U.S. rate of \$10 per ton, this is \$311,780 in saving)

\$10,073,005 (Canadian) saved in total

Thus, the position [of Sustainability Coordinator] could potentially pay for itself and then some over the years through energy, paper, and water conservation as well as through new waste disposal policies. The UBC Sustainability Office is, in fact, completely funded by money saved from its energy reduction programs. It consists of three full-time and two part-time staff members.

Essentially, other than \$50,000 in seed funding to develop a business plan, the office has been self-funded right from the beginning. When the office was formed, they were given control of the existing operating budget for paying campus utility costs (electricity, steam, gas, water and sewage) and out of that existing funding they paid for all of the annual utility costs plus their salaries and office operating expenses. So in effect, all of their office funding, including the salaries, are paid from the savings they achieve through reductions in utility costs. This has been the way the office has been funded from the beginning and even now they still receive funding only for baseline utility costs and nothing for their salaries and operating expenses. However, the baseline utility costs are adjusted each year for weather, utility rate changes, and changes in building area. For example, if the weather is colder than normal, they receive extra money; and if it is warmer than normal, they give some back. If rates increase, they receive more funding; and if rates decrease, they return funding. Also, they receive extra funding for new buildings but lose funding for demolitions.

All of their projects are funded in the same way. They take out a loan from their Treasury department and pay it back from the savings to the utility costs. That is how they funded their lighting upgrade projects as well as ecotrek, their \$38 million comprehensive energy and water upgrade project (<http://www.ecotrek.ubc.ca>). Other than a little bit of minor capital funding and some incentives and grants from BC Hydro and Natural Resources Canada, all of their funding has come from reductions in utility costs. Since 1999-2000, those reductions have totaled over \$10 million. This fiscal design produces a positive feedback cycle where the more successful the sustainability projects completed the better able the office to make large scale impacts to create a more sustainable, money-saving campus. This design also allows important projects that have a long-term payback to become economically feasible.

Appendix 7:

Social Change Models

Community-based Social Marketing

The alternative to exclusively education or economic based programs which McKenzie-Mohr and Associates presents in the web-based book *Fostering Sustainable Behavior* is community-based social marketing. This process includes five steps:

- Selecting a specific behavior to promote.
- Uncovering barriers to the behavior.
- Designing a program to overcome selected barriers.
- Implementing the program, with an initial small-scale pilot program.
- Evaluating the program once it is broadly implemented.

There are many tools of change which can be used in the process of removing barriers to behaviors. They include:

- *Building Motivation over Time:*
 - Links desired behavior to present activities.
 - Recognizes individuals for actions they are already doing.
 - Provides opportunities for individuals to become involved at any stage.
- *Personal and Group Feedback:*
 - Gives participants information about the impacts of their actions.
 - Helps individuals learn from their actions.
 - Helps individuals feel that they are making a difference.
- *Financial Incentives and Disincentives:*
 - Rewards desired behaviors.
 - Discourages undesired behaviors.
- *Norm Appeals:*
 - Creates group standards or highlights existing group standards.
 - Creates positive peer pressure.
- *Obtaining a Commitment:*
 - Increases follow-through by giving participants a written set of goals.
- *Prompts:*
 - Increases participating by ensuring that individuals do not abstain from an action simply because they forget to do it.
- *Personalized Communication:*
 - Helps individuals relate to the goal by using language that is tailored to appeal to the target audience.
- *Face to Face contact:*
 - Ensures that participants are aware of the campaign.
 - Gives participants the opportunity to ask questions.
 - Increases participation by putting a personal face to the issue.
- *Mass Media:*
 - Allows messages to reach a wide audience at one time.
- *Block Leaders:*
 - Increases participation because individuals are recruited by people that they already know and trust.
- *Peer Support Groups:*
 - Increases consistent participation by giving individuals an opportunity to support each other in changing their behaviors.

- *Word of Mouth:*
 - Allows campaign to grow organically through the spontaneous spread of ideas and behaviors.

Getting-to-Outcomes

The GTO best practice process for monitoring community change is based upon ten Accountability Questions:

1. What are the underlying needs and conditions in the community?
2. What are the goals, target populations, and objectives (i.e., desired outcomes)?
3. Which evidence-based models and best practice programs can be useful in reaching the goals?
4. What actions need to be taken so the selected program “fits” the community context?
5. What organizational capacities are needed to implement the plan?
6. What is the plan for this program?
7. How will the quality of program and/or initiative implementation be assessed?
8. How well did the program work?
9. How will continuous quality improvement strategies be incorporated?
10. If the program is successful, how will it be sustained?

One of the GTO creators, Dr. Abe Wandersman (wandersman@sc.edu), is a professor of Psychology at the University of South Carolina who specializes in environmental and ecological psychology, citizen participation and program evaluation. His colleague, Dr. Keith Davis, also a USC Psychology professor, recommended that Cornell contact Dr. Wandersman and look into using the GTO as a tool for creating its sustainability campaign. The GTO will soon be available in online format.