

The Sustainable University

Class Report

EN 103 The Sustainable University

IDCE 30185 Sustainability and the Role of Higher Education

Clark University, Worcester, MA

Fall 2010

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Front: Jennie Stephens (faculty instructor), Emily Sturdivant (peer learning assistant), Sr. Faustina Ganaa, Zhonghui Lv, Melissa Skubel, Eliza Lawrence, Sean Fitzgerald, Katy Cleminson, Sarah Pollock; Second Row: Justin Boyle, Tung Huynh, Reza Brooks, Nathan Maltais, Marie Bozeman, Rebecca Hertz; Third Row: Benjamin Gardner, Janessa Frias, Daniel Pologe; Back Row: Elizabeth Redlich, Liam Byrne; Not included: Dania Idriss, Faith Tendo.

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Introduction

Jennie C. Stephens

This final report is a collaborative effort detailing the team projects of 16 undergraduate students enrolled in EN 103: The Sustainable University and 4 graduate students enrolled in IDCE 30185 Sustainability and the Role of Higher Education (the graduate-level section of this course) during the fall 2010 semester at Clark University. In addition to reading and writing about the challenges of sustainability and the role of the university in promoting sustainable practices in society, in this course students engaged directly with the challenges associated with promoting sustainable behavior and fostering institutional and social change through semester-long team projects focused on specific sustainability initiatives within the Clark community. These projects have been an integral part of this course and this final course report includes culminating details on the five different semester-long team projects that these students developed this semester.

Throughout the semester, students in this class benefited greatly from engagement and interactions with multiple individuals within and outside the Clark community, including Chuck Agosta, Jody Emel, Paul Bottis, Andy McGadney, Jim Collins, Tom Wall, Micki Davis, Sarah Dupere, Susan Altman (MCAN), Gerry D'Amico, and several alumni. We extend appreciation to all of these people (and others) who have contributed to the success of this course and the students' efforts throughout the semester. In addition we all benefited greatly from the valuable dedication, coordination, and contributions of the course Peer Learning Assistant Emily Sturdivant (Geography '13) who took the course as a student during the fall 2009 semester. Thanks to Emily for participating in this leadership role!

During the semester, students in this class have read quite extensively the work of David Orr and others who have expanded on the notion that the impact of learning at institutes of higher education does not only occur in classrooms but throughout the campus community and space. Students have been exposed to and engaged with ideas that the university's policies and community priorities, as well as buildings and campus operations, all play a role in the education of students, and have a broader impact on society. We have explored how institutions of higher education have unique potential to catalyze and/or accelerate the transition to sustainability. The focus on the university provides a lens for students to examine how decisions with environmental consequences are made at institutions with complex structures. This situated students in a context for considering the broad role of education in sustainable development. And the course provided students with personal, direct connections and experiences facilitating learning about the challenges of promoting sustainability.

This semester has definitely been a learning experience for all of us. Given that the position of Clark's Sustainability Coordinator was vacant throughout the entire semester, and given that Clark University's Environmental Sustainability (CUES) Taskforce was inactive and did not meet even once during this semester, the students in this class had additional challenges associated with internal communication and connection with university-wide initiatives that students in previous years had not experienced. Given these circumstances, I am particularly proud of what these students have accomplished throughout the semester. I recognize that many of the teams had initial hopes of accomplishing more within this semester than they have

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ultimately been able to complete, but I also hope that they have learned that, as is the case in most “real-world” experiences, the complexities of engaging with and contributing to these projects turned out to be greater than many of the us initially anticipated.

Working with these students throughout the semester has been a pleasure. These students have worked hard and accomplished a great deal as they struggled with the challenges of promoting environmental sustainability at the individual, institutional, and community levels. While this report details the work done during the fall 2010 semester, several of these initiatives will continue to be developed and implemented by these students and others on campus beyond this semester. For up-to-date information about any of these initiatives please get in touch with me or with any of the students.

Thank you for your interest in these student projects!

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Renewable Energy Options for Clark University

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Abstract

Mitigating the anthropogenic forcing of climate change by reducing the carbon intensity of our energy systems is critically important. In addition to improving the efficiency of existing infrastructure, which represents an important albeit minor short-term solution, researching and eventually implementing renewable energy technology is the primary mechanism by which the necessary reductions can occur. Former Clark University President John Basset's signing of the *American College and University Presidents Climate Commitment* not only demonstrates Clark's support for climate change mitigation but also binds the university to the stated goal of achieving climate neutrality by 2030. In an effort to expedite the process of utilizing renewable energy technology at Clark, our team is laying a framework to analyze what types of renewable energy technology would be best suited to its campus. We have begun the process of installing AAG 1-Wire weather stations around campus, with our first successful installation on the roof of the Sackler Science Center, and will continue to work on this project through next year. After gathering data about wind speed, wind direction and solar intensity for a year, we will be able to extrapolate the data and make recommendations to the administration about what renewable energy technologies would be optimal for implementation and installation on the Clark University campus.

Introduction

Anthropogenically forced climate change is an urgent issue that demands society's immediate attention (McKibben, 2010). The average global temperature has risen in lockstep with increasing greenhouse gas concentrations, destabilizing Earth's climate, and the effects of this destabilization have already been noted across the globe (McKeown & Gardner, 2009). Manifesting through such processes as sea level rise, shifting climate zones, increased rainfall, increased drought, and increased desertification, these profound environmental changes will also have serious impacts on social concerns like human health, economics, and global justice (Butler, 2010; McKeown & Gardner, 2009).

Climate change and society's reliance on fossil fuels are issues that must be addressed simultaneously, as the combustion of fossil fuels is responsible for 56.6% of all anthropogenic greenhouse gas emissions (Butler, 2010; Holdren, 2006; McKeown & Gardner, 2009). An analysis of the factors responsible for current levels of carbon emissions via the I=PAT equation

yields insight into the primary mechanisms by which mitigation may occur (Holdren, 2006):

$$Emissions_C = Population \times \frac{GDP}{Person} \times \frac{Energy}{GDP} \times \frac{C}{Energy}$$

Equation 1: Anthropogenic carbon emissions as a factor of population, GDP per person, energy intensity of GDP, and carbon intensity of energy supply.

Behavior change is one method to mitigate carbon emissions, and would be represented in the equation by a decrease in the energy intensity of GDP. The second method involves lowering the carbon intensity of energy by utilizing different/more efficient technology, and is the focus of our team.

Renewable energy technologies, which do not emit large amounts of CO₂ into the atmosphere, have received positive responses as potential mechanisms to help resolve environmental problems (Leiserowitz *et al.*, 2006). However, there are significant barriers to widespread implementation of such technologies. Approximately 80% of the world's energy is generated by the combustion of fossil fuels, and trillions of dollars are currently invested in existing fossil-fuel energy infrastructure (Holdren, 2006). With structural and economic barriers hampering attempts to implement renewable energy on a larger scale, the impetus to explore the potential of these technologies falls, at least in part, on colleges and universities. Large enough to fund their own energy infrastructure projects and capable of commanding public attention, institutions like Clark University are perfectly poised to model implementations of renewable energy technology (Stephens *et al.*, 2008). Our team subscribes to this perception of the university's role in society.

Working closely with Professor Chuck Agosta, a member of Clark's physics department, we ultimately aspire for Clark to install renewable energy technology on its campus. We acknowledge that this will not be possible right away, however, and as such our more immediate aim is to lay the framework for future installations of renewable energy systems. To assess the feasibility of harnessing wind and solar energy, our team will be installing and collecting data from AAG 1-Wire weather stations. When we have gathered and analyzed a full year's worth of data, we'll be able to make recommendations about what technologies are best suited to Clark's campus.

Background

The American College and University Presidents' Climate Commitment is an effort by the leaders of institutions nationwide to address the threat of climate change. Acknowledging that achieving climate neutrality on collegiate campuses will not mitigate climate change by itself, the 676 ACUPCC signatories seek to define and illustrate the steps necessary to combat this pressing global issue (ACUPCC, 2010; Stephens *et al.*, 2008).

With former Clark president John Basset's signing of the American College and University Presidents' Climate Commitment and the creation of Clark University's Climate Action Plan, the institution committed itself to achieving climate neutrality by 2030 (Clark University Sustainability Taskforce, 2009). While on-site utilization of renewable energy is

among the mitigation options presented in the Climate Action Plan, the Sustainability Taskforce anticipated that such implementation wouldn't occur until the cogeneration plant was no longer economically beneficial to maintain (Clark University Sustainability Taskforce, 2009). This project seeks to enable a more immediate installation of renewable energy technology than the Climate Action Plan's tentative projection of 2025.

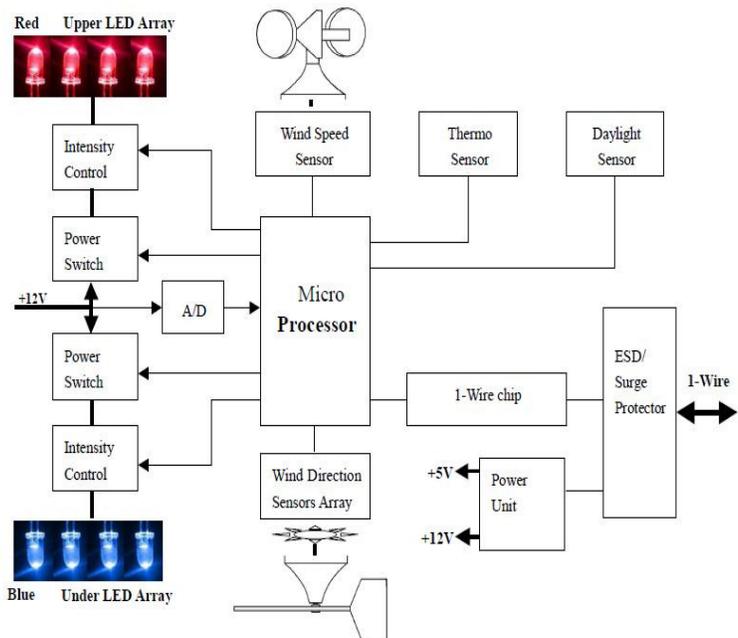
The cogeneration plant itself is a symbolic example of what this team ultimately seeks to accomplish. The initial research into Clark's energy infrastructure was conducted by the university's students, and their work ultimately resulted in the university's cogeneration plant (DeCarolis *et al.*, 2000). In a cogeneration system, excess heat from electricity generation is utilized for space heating, meaning that less energy needs to be expended for temperature regulation purposes (Schmidt, 2010 Personal Communication). It is our hope that our efforts will also result in the installation of technology that reduces the carbon intensity of Clark's energy.

AAG 1-Wire Weather Station

To assess the viability of harnessing wind or solar energy on the Clark campus, we used weather stations to collect data about wind speed, wind direction, and solar intensity. Professor Agosta had worked with AAG 1-Wire weather stations prior to this project, and his familiarity with their operation was a primary reason why our team opted to use this brand of weather station. He advocated that this brand was well suited to the project's needs because the stations themselves were inexpensive and because the software we would use to run them is open source and therefore highly customizable (Agosta, 2010, personal communication). We opted to use the most recent model, the WS603, which is advertised as being more reliable and durable than previous models (AAG Electronica, 2010).

Figure 1: WS603 Weather Station Schematic

WS603 Digital Anemoscope Functionality Block



Process

During the course of the semester, our team simultaneously undertook several distinct projects in an effort to assess Clark's renewable energy implementation potential. First, we investigated the feasibility of utilizing a battery storage system in tandem with the existing cogeneration plant to increase the efficiency of on campus energy production. While doing this research, we began the process of installing weather stations to assess the campus' potential for harnessing wind and solar energy. This process has comprised the bulk of our project, and we will continue it after the end of the fall semester. We also explored the major renewable energy systems installed at Worcester State University and Holy Name Central Catholic Junior/Senior High School to determine whether the applications of renewable energy that other schools have utilized would be suitable for the Clark campus.

Battery Storage System

During the early stages of the project, Professor Agosta suggested that we research the feasibility of installing a battery storage system on campus. While not a means of producing energy, a battery storage system nonetheless would reduce the carbon intensity of Clark University's energy system by enabling the cogeneration plant to run more efficiently (Agosta, 2010, personal communication). Currently, the cogeneration plant's energy production rates vary according to energy demand on campus, as it is wasteful to generate more electricity than the campus is consuming. However, varying the speed of the engine reduces its overall efficiency and lifespan. A battery storage system would allow the engine to constantly run at full capacity because energy generated during non-peak hours could be stored and later used during peak hours. This would significantly reduce the overall carbon emissions of Clark's energy infrastructure for two reasons (Agosta, 2010, personal communication). First, and most directly, energy generated by the cogeneration plant is less carbon intensive than the energy produced by national grid, so increasing our energy independence innately implies that the carbon emissions will decrease. Secondly, reductions in the National Grid's overall energy demand make it less likely that they will need to use additional high-emissions plants during peak-hours (Agosta, 2010, personal communication).

While the installation of a battery storage system would increase the overall efficiency of Clark's energy system, it is unlikely that we will be installing one any time soon. Professor Agosta met with National Grid, whose initial reaction was that, as a largely untested technology at the scale Clark would be seeking to implement, a battery system would be a large risk (Agosta, 2010, personal communication). As the area's electricity providers, National Grid is primarily concerned with reliability and is worried about an unreasonably high potential for a system crash that would adversely affect them. This response, coupled with the incredibly high price for a battery storage system, puts a battery storage system out of question for the immediate future (Agosta, 2010, personal communication).

Weather Station Installation

As with all major infrastructure investments, installations of renewable energy technology must be sufficiently demonstrated as economically viable. If a technology's payback period is too long, then even the prospect of eventual savings may be unable to justify the initial investment required. While harnessing wind or solar energy would aid the university's goal of attaining climate neutrality by 2030, if doing so would not provide enough energy to mitigate the costs of installation then we cannot reasonably expect Clark to install wind turbine(s) or photovoltaic cells. Our decision to install weather stations around campus stemmed from this fact, as we hope to show that renewable energy infrastructure would be a fiscally sound investment.

If we were to harness wind or solar energy on campus, it would be critical that the places we opted to do so were unobstructed by trees or buildings. Logically, the locations we selected to install weather stations must reflect this fact. Accessibility is also an important concern, as the stations may require periodic maintenance and safety is always of paramount importance. After consideration, we concluded that the Sackler Science Center, Jonas Clark Hall, Jefferson Academic Center, Goddard Library and Lasry Center for Biosciences were potentially viable locations to install weather stations. By installing weather stations on the rooftops of several different buildings, it will be possible to assess variations in resource availability and ensure that observed trends in the data collected are accurate.

There are a myriad of other logistical concerns that must to be addressed with the installation of each weather station. The most immediate of these is how the weather station will be affixed to the roof. The weather stations will be in operation for at least a year, and it's important that they are well secured to the buildings' existing structure. Each weather station will be mounted on a pole, and it is this pole that must ultimately be attached to the building. The length of the pole itself is variable, as we need to ensure that nothing will obstruct the data collection. It is also important to attach guide wires to the pole for stabilization purposes. In high winds, it is probable that the pole would sway or vibrate, skewing our data and potentially damaging our equipment. To further protect the stations from damage, we plan to ground them. This process should generally be straightforward, as other equipment on the roofs of buildings is already grounded.

Another subset of logistical concerns relates to the data collection process. Data collected by the weather stations is transmitted to an adaptor via CAT5 cable using the 1-Wire protocol and subsequently transferred to a computer via a USB connection (AAG Electronica, 2010). The location of this computer is important for several reasons. While, in order to prevent tampering the computer should not be in a publicly accessible space, it is also important that it remains relatively accessible so team members can perform any necessary maintenance. Additionally, the signal from the

Figure 2: 1-Wire to USB Adaptor



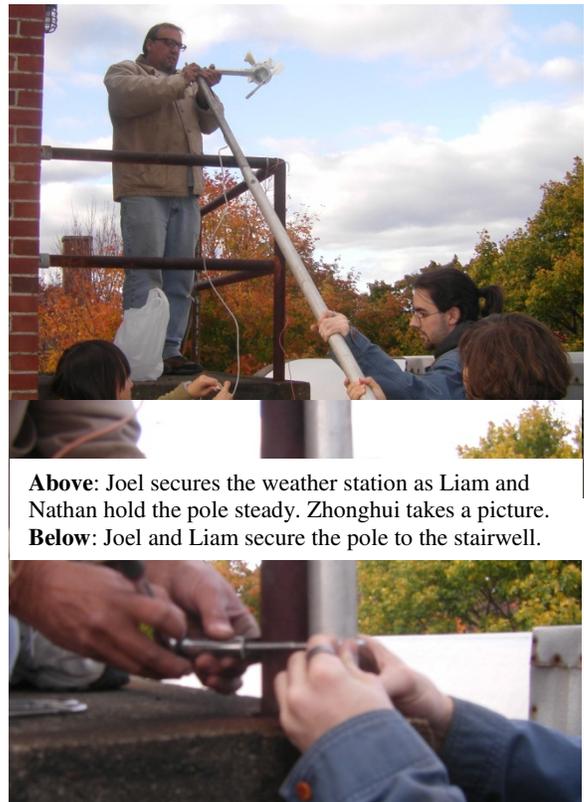
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weather station cannot travel indefinitely along the cable. The computer must be close enough to the station that data collection isn't subject to signal transmission issues.

The software that runs the weather stations is just as important as the hardware itself. Working with open source Java code provided by ExtremeTech Weather Toys, we are working to ensure that we can accurately collect data the necessary information about wind speed, wind direction, and solar intensity (Bison 2006; Bison 2010). Having worked with AAG 1-Wire weather stations in the past, Professor Agosta had already made some modifications to the Mac OS X code (Agosta, 2010, personal communication). Our work editing the code this semester has primarily focused on developing functionally identical code for PCs. Moving forward, our next major step is to implement code that will allow the computer to translate the station's transmission of data about solar intensity. While not an urgent priority this semester because we have been concentrating on preparing the hardware for installation, making this improvement will be critical to the long term success of the project.

Throughout the project, we were continually in contact with representatives of physical plant. We required their assistance to access rooftops so we could assess the best locations to install weather stations, and will need their help again when the time comes to do the actual installation. They have been very open in providing us with this assistance. Derek Lundstrom took Professor Agosta and members of our team on the roofs of Jonas Clark Hall, Jefferson Academic Center and the Goddard Library to help us plan our installations in advance.

Our team decided to install the first weather station on top of the Sackler Science Center because it was the most accessible of the sites we examined. While not necessarily an ideal site to be gathering data about wind speed and direction because it is abutted by the taller Jonas Clark Hall, we felt that ease of access to the roof and proximity to the physics department were sufficient reason to do this installation. This level of accessibility will allow us to troubleshoot and test modifications to the software without needing to contact other departments for access to the roof or computer. Joel Norton, director of the physics machine shop, assisted with the installation process. He provided us with a 20 ft metal pole, which we used to mount the weather station to an unused stairwell. We put the computer in the physics lab. While this is a public location, the computer will not be confused as available for use. Elio Chimento, an electrician from physical plant, helped us run the CAT5 cable, but we ran into issues with data transmission. Forced to find a shorter route to the second floor of the biophysics



Above: Joel secures the weather station as Liam and Nathan hold the pole steady. Zhonghui takes a picture.
Below: Joel and Liam secure the pole to the stairwell.

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building, we ran the cable off the side of the building and in through a gap in the wall. The station is now actively collecting data and transmitting it to that computer.

Since we completed the installation on top of Sackler, we have been preparing for the other installations. We had one weather station remaining, and no poles with which to mount weather stations. Our team reached out to student organizations on campus requesting assistance funding our project. Clark Sustainability Initiative covered the cost of purchasing a second weather station, and Cycles of Change funded the purchase of military surplus fiberglass poles with which to mount the stations. Our team plans to complete the next two installations on top of the Goddard Library. We contacted ITS, who suggested a location on the fourth floor where we could keep the computer. Our plan is to run both stations to this computer. Currently, we have all the materials we need and are eager to install the stations when we return from winter break.

Case Study: Worcester State University

In May 2009, Worcester State University, a Massachusetts state school with an undergraduate population of about 3,000, installed a 106.4 kW solar photovoltaic system on the roof of their Learning Resource Center (Worcester State University, 2010). The system, which consists of 540 individual 195 watt panels, has generated 182,290.78kWh of electricity since it was installed. This provides approximately 20 percent of the Learning Resource Center's energy. The implementation of this renewable energy infrastructure has reduced the university's emissions, effectively preventing the release of 314,462 lbs CO₂, 458 lbs NO_x and 1,378 lbs SO_x since its installation (Daniels, 2010, personal communication; Worcester State University, 2010).

Case Study: Holy Name Central Catholic Junior/Senior High School

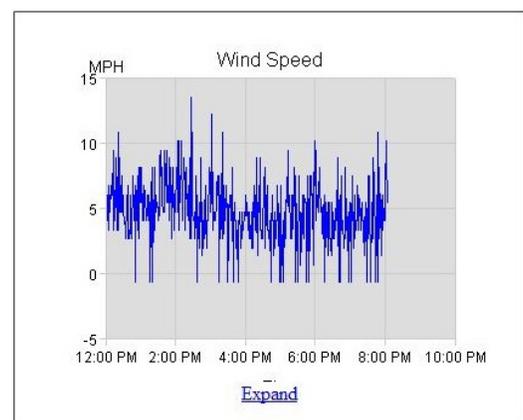
Holy Name Central Catholic Junior/Senior High School began investigating renewable energy technology as an alternative to electricity costs that had risen to almost \$200,000 annually (Reynolds, 2010, personal communication). Research by a team of WPI students revealed that the school was an ideal location for the installation of a large, horizontal-axis wind turbine (Hensen *et al.*, 2006). After receiving funding via several grants and loans, they installed the 600kW wind turbine. Currently, the wind turbine meets 60-70 percent of the school's electricity needs during the winter months. During the summer, the wind turbine produces more energy than the school requires and they are able to sell excess electricity back to National Grid (Hensen *et al.*, 2006; Holy Name High School, 2010).

Results

Gathering Data: Sackler Weather Station

While it is too early to begin significant data analysis, the successful collection of data from the weather station atop the Sackler Science Center facilitates our understanding of the data collection process and of how

Figure 3: December 6th Wind Speed Data



we will use later data. The software that runs the weather stations functions as a web server, enabling anyone with internet access and knowledge of the computer's IP address to access the data that has been collected. The data is saved in log files, recording values in one minute intervals. The web interface graphs values from the most recent log file. It is apparent from the data already collected that additional calibration of the station may be needed, as baseline wind speed values sometimes dip below zero. However, negative data values do not always indicate miscalibration. The software uses extreme negative values, such as -999.99°C and -999.99 mph to indicate that there is an issue with data transmission between the weather station and the computer.

Comparative Case Studies

Our investigation of Worcester State University and Holy Name Central Catholic Junior/Senior High School's renewable energy systems shows that the Worcester region is fully capable of supporting such technology. However, Clark's campus is not necessarily capable of supporting the same infrastructure as these other schools. In particular, zoning restrictions and space limitations make installing a large horizontal-axis wind turbine impractical if not entirely impossible. One potential alternative to a large wind turbine is a series of smaller, vertical-axis wind turbines. Vertical-axis wind turbines are small and are ideally suited to rooftop applications, meaning that we could still utilize wind energy at Clark if our data suggests we have sufficient conditions. Clark may also be able to utilize photovoltaic solar cells like those installed at Worcester State University. Clark's administration and physical plant are currently in discussions with an external group offering to provide the university with a non-guaranteed capacity of 1-2% its current electrical load from an offsite location utilizing photovoltaic cells at a lower cost than the university currently pays for its energy (Collins, 11/29/2010, personal communication). While not an on-site application of renewable energy, this potential nonetheless reduces the carbon intensity of Clark's energy and is therefore worth pursuing.

Conclusion

Our team's work on this project is far from finished. We have several more weather stations to install around campus and, as we were aware from the outset, once all the weather stations are installed and functioning we will need to collect data for a full year before we are able to confidently make recommendations about what renewable energy systems would be the best fit for Clark's campus. As a team, we have decided to continue working on this project beyond the end of this semester. We are currently in the process of determining what form this ongoing participation will take. Potential options we have discussed include forming a student group or continuing the process as an independent study under Professor Agosta's guidance.

Regardless of in which capacity we chose to proceed with this project, our experiences this semester have prepared us to continue our work assessing the Clark campus's potential for harnessing renewable energy. Over the course of the semester, we've established contacts within several different departments, such as ITS and physical plant, who are supportive of our efforts

and will continue to assist us as we move forward. Cycles of Change and Clark Sustainability Initiative, two environmentally minded student groups on campus, have also shown their support for our project by purchasing equipment that we will be using for our upcoming installations, and we expect that support from members of the student body would only increase with heightened awareness about our project.

In addition to the successful steps we've taken, our team also benefits from an awareness of the challenges that we encountered during our first semester of working on this project together. This semester, we found that some members of our team were doing very little work on the project while others handled much larger portions of it. This was neither intentional nor because team members were less willing to contribute, but rather the result of poor planning and time management. Several times the team was prepared to take the next step, but found that we still needed to contact the appropriate people before we could do so. When this happened, some of us were able to work on side projects, such as the code that runs the weather stations, but others had no tangible work to contribute. The lesson we have learned from this is twofold. First and foremost, we need to initiate contact with groups whose assistance we'll need farther in advance and do a better job documenting the results of these conversations for the team's reference. While there is value in having a designated team member responsible for external contact, it is important that all group members are aware of what information is being exchanged. Secondly, we need to be more equitable in our distribution of work among team members or, alternatively, be more proactive in finding work that can be done.

Given that we have already established the appropriate contacts and have the necessary supplies to install several weather stations; we are well poised to continue our efforts by making installations on top of the Goddard Library early in the spring semester. While this is the most tangible and most important objective for early next semester, we are also prepared to make significant improvements to the code that runs the weather stations. While the station currently can gather data about solar intensity, the software that runs on the computer is not set up to collect it. Adding this functionality is our top priority, as without it we will be unable to assess the campus's suitability for the installation of photovoltaic solar cells. We also plan to add software that will alert us directly if a weather station stops functioning, as it is important to ensure that the gaps in data collection are as small as possible. Finally, we plan to update the software so the web interface allows for easier remote access to the log files. Making the data more accessible from remote locations will make it easier to disseminate amongst team members and facilitate our eventual analysis of the data.

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Behavior Change in the Residence Halls: A Sustainability Competition

Sean Fitzgerald, Janessa Frias, Sarah Pollock

Abstract

Our team worked with the Clark Ecological Representatives (Eco-Reps) to construct and carry out a month long dorm versus dorm sustainability competition which has a goal of helping to educate students about energy consumption and promote energy-use reduction within the residence halls. By designing and executing the competition, as well as monitoring the actual energy use of each dorm, our group promoted behavior change among students in an effort to reduce electricity consumption on campus. The different aspects of putting the competition together included designing sustainable events to raise awareness of the competition, advertising, and providing information and tips on how students can reduce energy. The competition occurred from November 7 until December 7, and after analyzing each dorm's energy use data, we found that seven of the nine residence halls decreased in energy use during the competition. Though proving that the decrease in electricity use was a direct result of the competition is not possible, the competition was successful in that students were provided both information and incentives to change their behavior. As part of our team project we also created a document with a detailed outline of the different aspects of the competition to be used in future years to help members of Eco-Reps to continue to implement this initiative and help promote sustainable behavior.

Introduction

The focus of our team project was the exploration of how to reduce energy consumption on Clark University's campus through behavior change. In 2009 the Clark University Sustainability Task Force put together a Climate Action Plan. One of the missions of the plan was to slow Clark's emission growth through footprint management (Clark University, 2009). Using energy efficiently and minimally is an important aspect in minimizing Clark's ecological footprint.

The student run organization on Clark, called Ecological Representatives (Eco-Reps), was formed in conjunction with the Task Force to promote sustainable behavior within the residence halls and therefore help lower Clark's ecological footprint (Clark University, 2009). Lowering energy use in a residence hall environment is especially important because there are a lot of people living in close proximity and energy use is concentrated.

In 2006 Clark's main campus buildings used a total of 11.7 million kilowatt hours of electricity (Clark University, 2010). Clark is already invested in making technological changes

when it comes to electricity consumption. The installation of the cogeneration plant, along with frequent renovations, such as the recent renovations in Bullock and Wright Hall, help lower Clark's ecological footprint (Clark University, 2010). Residence halls, like the nine on Clark campus, account for a large percentage of college campus buildings, which means those buildings account for the majority of energy consumption (Petersen et. al, 2007).

Promoting sustainable behavior in the residence halls can be challenging due to barriers such as, "one's lack of knowledge, non-supportive attitudes or an absence of motivation (Mckenzie-Mohr, 2008)." Students living on campus pay the same amount of money as the next student, regardless of how much water or electricity they consume. Because of the lack of economic constraints, behavior change on campuses must come from a situational factor (like a competition), which makes it easier for people to take action about environmental issues (Kollmuss et. al., 2002).

In order to induce sustainable behavior within the residence halls we collaborated with Eco-Reps to plan and organize the 2010 Hall vs. Hall Sustainability Competition. Through this competition we hoped to reduce energy use in the nine residence halls on campus while helping students gain knowledge about energy consumption and tools on how to live a more sustainable lifestyle.

Background

As climate change awareness is rising, more people are making efforts to live sustainably to help minimize their impact on the earth (Leiserowitz, 2006). Climate change awareness and knowledge of sustainable practices are promoted and spread via local and global organizations, and universities are increasingly playing a critical role (Rowe, 2007). Clark University has made efforts to make a smaller impact on the earth by creating student run clubs to promote sustainable practices and spread awareness. Clark has also created a Climate Action Plan, in which the university outlined their goals for reductions in carbon emissions and other environmental projects (Clark University Climate Action Plan, 2009). Along with the Climate Action Plan, Clark University offers courses and majors related to sustainability and climate change. President Bassett also created the Clark University Environmental Sustainability Task Force, which included faculty, staff, and students to facilitate, organize, and execute Clark's efforts in sustainability (Sustainability Task Force, 2006).

In 2008 Eco-Reps was founded by Emily Schweitzer out of The Sustainable University class and the Sustainability Task Force (The Sustainable University, 2008). The mission of Eco-Reps' is to promote sustainability in the residence halls. The goal of our team project was to collaborate with Eco-Reps in order to host the second annual sustainability competition, i.e. –last year was the first time that Eco-Reps organized and implemented a residence hall competition focused on sustainable behavior. Last year's competition was used as a basis and structure for this year's competition. Using the sustainability competitions of other universities and colleges like Middlebury College, Connecticut College, Wheaton College, and Harvard University as models, we modified Clark's Sustainability Competition. Some of these modifications included

different themes, event ideas, and methods of advertising (Hall Competition, 2009) (Clark University Eco-Reps, 2010).

For our project we tried to encourage behavior change in students so that they may live more sustainably (Mohr, 2008). Sustainable living and behavior change will lead people to save money, resources, and energy; as well as improve our environment. We hoped that the spread of knowledge related to students' own consumption behavior choices would produce more ecologically conscious students, and that Clark University would benefit by experiencing the effects of sustainable living directly.

The effectiveness of using competition as a motivator in encouraging behavior change has been well demonstrated. A study by researchers at Arizona State University found that when different households competed to use less energy; and saving energy was portrayed as a good thing, behavior change is likely (Shultz et al., 2007). Competition can serve as a tool to get people involved; in turn, making it at least seem as if, if not prove that, becoming environmentally friendly is becoming a norm. Another study done by researchers at Arizona State University stated that people are more likely to change if they feel that acting environmentally is good and that people around them are acting environmentally (Cialdini, 2003). Clark's Sustainable Competition has informed the students of the benefits of acting environmentally and shown them that more people are beginning to act environmentally. Competition between the residence halls emulates the competition between colleges and universities which are "...scrambling to burnish their sustainability credentials" (Galbraith, 2009). Overall, competition between colleges and universities has led to greener campuses. In an effort to be the "greenest" school, universities are "...adding courses related to sustainability and energy," and improving on recycling, green building, and student involvement (Galbraith, 2009). In using competition as the method to encourage behavior change at Clark, the team had hopes of producing the same result.

Process

The goals of our group were to plan and organize a month long dorm versus dorm sustainability competition with the aim of reducing energy use on campus and fostering sustainable behavior. We entitled this competition "Do it in the Dark". The components of the competition that we focused on coordinating events to promote awareness about the competition. The goal was that these events be both fun and encourage students to reduce electricity, providing students with information and tips on energy use on campus and what they can do to conserve it. We also focused on other mechanisms to advertise the competition. Other aspects of the competition that had to work on included requesting various sustainable and eco-friendly companies for donations of prizes and funds from campus organizations such as Initial Advantage and Clark Sustainability Initiative, to help financially support the competition. The prizes we received included eco-friendly bags and water bottles, which were raffled off to students from the winning dorm, as well as ice cream from Ben and Jerry's, which was used for the final prize.

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The first stage of our process was to schedule meeting times and delegate roles for each member of the group to clarify our individual responsibilities, as well as creating a proposal that would explain and serve as a guideline for our project. We also had to create a feasible time line to work on, and get in touch with members of Eco- Reps as well as our contact person, Emily Sturdivant, who is a Clark student, the Peer Learning Assistant for our class, and also a member of Eco-Reps. Our communication with Emily and the other Eco-Reps continued throughout the planning phase and the course of the competition as they helped us to establish our responsibilities as a group, and how much control we would have over the competition. Our role was to plan and organize the competition and the role of Eco-Reps members was to execute it.

Because our project required us to focus on the logistics of organizing a month-long competition for Clark University students to compete in, the next part of our process was to research competitions of a similar nature that took place in other universities such as Northeastern University (“Heat”, 2010) and University of Vermont (“UVM Eco-Reps Program”, 2010). We searched these school’s environmental student group web pages to help us brainstorm ideas and formulate a basic outline for us to work on. We spent our first group meetings gathering and analyzing aspects of other universities’ campus sustainability groups so we could choose what we thought would be successful on our own campus, and what might not be as successful. After research and discussion of the feasibility and environmental impact of several potential fun events that would encourage students to use less energy, we decided to plan a dorm storm , during which members of Eco-Reps as well as our group entered dorms, passed out energy saving CFL’s (compact fluorescent light) and informed students about the competition, as well as two campfires, and a night of stargazing. We tried to design the events in a way that would encourage students to turn off their lights and appliances and to engage in simple, sustainable activities. Below is a finalized timeline of the competition’s events.

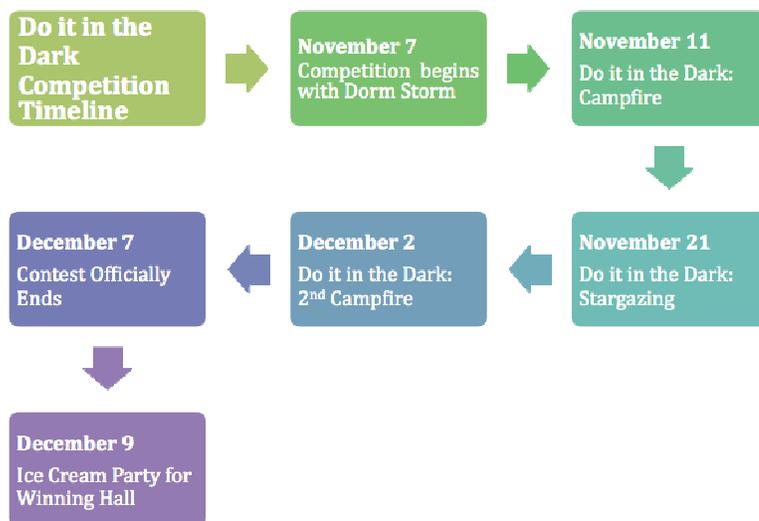


Figure 1. Timeline of the events associated with the “Do it in the Dark” Residence Hall competition.

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The next step of the process involved creating a proposal to request funding to support the competition. We needed funding to purchase food and beverages and supplies such as cups and napkins for the two campfires and the stargazing event. We also needed funds to help pay for advertising costs, such as printing and the green ribbons that were hung throughout the residence halls. To request donations for prizes, we sent out emails to companies explaining that we were helping to run a competition to promote sustainability and energy reduction on the Clark University Campus. We also sent out thank you emails to companies as a follow up for their donations.

Other tasks that we worked on included gathering information to create informative emails and advertisements that would let students know about the competition and what they could do to change their behavior and help their dorm win. We also created a detailed and organized list of all the tasks and plans for the Eco-Reps to use to execute the event. Our responsibility for the competition continued as we worked with Eco-Reps to execute and advertise for events, as well as other various tasks, such as picking up donated prizes from companies, and writing thank you letters to the companies that donated.

Challenges that we faced in this group included acquiring funding, figuring out the most effective ways to advertise the events and information about how students can reduce electricity use, and dealing with the absence of a sustainability coordinator on campus this semester. When we began this project, we were expecting to be able to focus solely on designing the competition, but we soon learned that there was no funding to make the events possible. So early on we had to divert our focus to getting funding to make the competition work. It was also difficult to find ways to reach out to students and communicate the issue of energy and how behavior change could make a positive impact on consumption. Last year, members of Eco-Reps had assistance from David Schmidt, the university's Sustainability Coordinator, with getting access to Clark's energy metering system, and also in analyzing and displaying the data from it. This year we were not able to receive such assistance because David had left and his position is currently empty. The absence of a Sustainability Chair made the competition challenging because we had to figure how we would be able to access the energy metering system, and work with the data. However, we were able to work with Hannah Tirrell-Wysocki, who is the Outreach Committee Head of Eco-Reps, and who is also interning for the sustainability coordinator's office. She helped us to analyze the data from the electricity meter.

Working in a team to help plan and implement a competition was difficult because we each have different schedules and different availability of time to commit to the project. Also, having only three members in the group made it difficult to delegate tasks so that the work was not too overwhelming. Despite the challenges of working as a team, it was also very helpful because each of us had different ideas, experiences, and opinions to bring to the table and contribute to the project.

Results

One of the most important aspects of this competition was actually tracking the electricity usage in the halls. The source of this information was from an online meter created by Physical Plant that can be accessed by anyone at this website (emon.ad.clarku.edu/ion). This meter logs energy usage in kilowatts every fifteen minutes for each residence hall. However the kilowatts were recorded as an accumulation, so there was no zero point. Because there wasn't a starting point, the weekly results are based on an index of the average kilowatts every fifteen minutes.

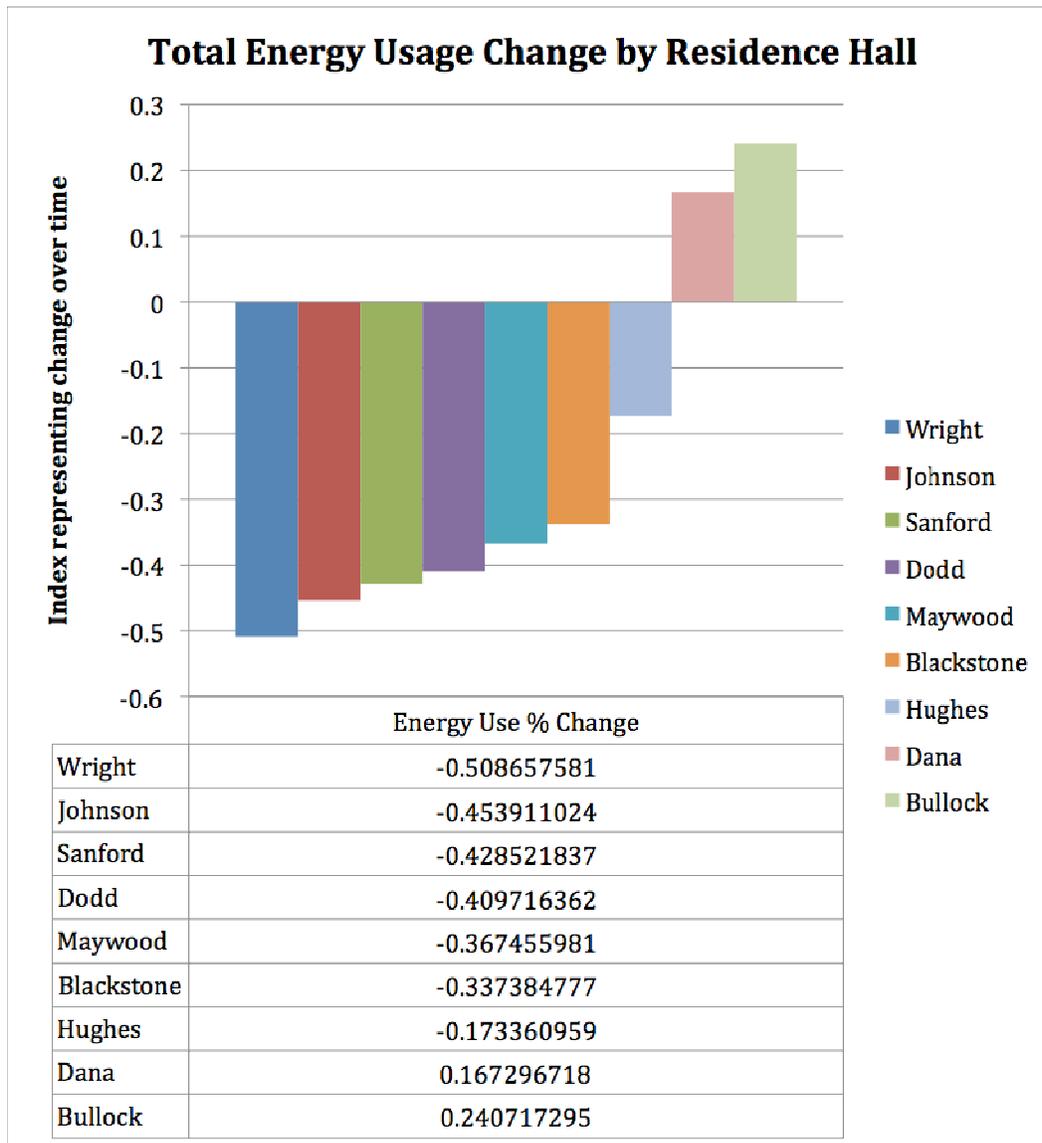


Figure 2. The results of the month-long residence hall competition.

Throughout the four-week competition, energy usage fluctuated, but an overall decrease was recorded in 7 of the 9 residence halls (See Figure 2). We only recorded energy usage three out of the four weeks because we skipped over Thanksgiving break week. The first week around

half the halls increased energy use and the other half decreased. During the second week, however, all the halls reduced their electricity consumption and during the final week almost all decreased. The competition ended December 7th, and the winner was determined to be the hall that reduced their energy consumption the most over the three weeks. As seen in figure 2, Wright Hall had decreased consumption the most, and seven out of the nine halls decreased energy consumption throughout the whole competition.

The decrease in energy is especially impressive because the competition was held during a colder time of the year when lights are usually turned on more often and people spend more time indoors. Given the complexities of electricity usage and human behavior in these residence halls, we cannot claim a direct causal relationship between the reduction in electricity usage and the competition. However, we hope with a few more years of data from other competitions an explicit association will be found.

Conclusion

In conclusion the “Do it in the Dark” residence hall competition of fall 2010 was a success. This competition and the associated events and outreach efforts has exposed students to information that encourages them to consider changing their personal behavior with respect to their resource use. With more time and effort we feel that this competition can derive a more direct influence on energy use and hopefully, its reduction. In relation to our original goals, which were to educate the student body about energy consumption and reduce energy use within the residence halls, we have ultimately met them throughout the process. Even though our influence on the student body is difficult to quantify or prove, the competition itself was carried out successfully.

The challenges and obstacles encountered throughout the process, lack of funding for events and prizes, finding a way to measure the energy usage of the residence halls etc., have led us to suggest certain recommendations for the competition in the future. For the team leading the competition in the future we recommend: 1) Stay as organized as possible 2) Contact students involved in previous years’ competitions for guidance and base the competition off of other university competitions as well. In contacting students involved with the competition in the past, the team may also consider collaborating with other student environmental clubs and the Sustainability Task Force at Clark. 3) Make sure to maintain frequent communication 4) Use all possible resources and get as much funding as possible, early on and 5) Advertise more effectively. In following these recommendations, the future team should achieve greater success through the Sustainability Competition.

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Massachusetts Climate Action Network
Annual Conference:
Fostering grassroots climate activism
Tung Huynh, Dania Idriss, Eliza Lawrence, Melissa Skubel

Abstract

The Massachusetts Climate Action Network (MCAN) is a non-profit, environmental organization based in Boston, Massachusetts. The goal of our team project was to help MCAN in organizing their Annual Climate Action Conference that was held on October 24, 2010 at Clark University in Worcester, Massachusetts. The project included working with MCAN in pre-conference planning, advertising and recruiting volunteers, as well as facilitating the MCAN staff throughout the day of the event. In addition, our group created a wiki page as a follow-up to the conference. This report serves as an overview of the collaborative working process between our team and MCAN for the conference, as well as the discussion of the role of environmental non-governmental organizations (ENGOS) like MCAN in fostering grassroots climate activism in the United States

Introduction

Climate change is one of the most difficult challenges facing our society today. As evidence in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), there are “discernible human influences” on global climate due to the accumulation of anthropogenic greenhouse gases (GHGs) in the atmosphere (IPCC 2007). Despite shifts in global temperature attributable to natural forcing throughout Earth’s history, there is a consensus among climate scientists that human activities since the onset of the Industrial Revolution have accelerated the rate of climate change (IPCC 2007). Consequently, significant rise in sea level, alteration of climate patterns, and increased extremity of weather events is having catastrophic impacts on the ecosystems and overall welfare of humans on Earth (IPCC 2007).

Since the adoption of the of the United Nation Framework Convention on Climate Change (UNFCCC) in 1992, subsequent rounds of international climate negotiation have signaled a concerted effort among national leaders in making progress toward climate change mitigation (Mace 2010). Despite the growing interest among developed countries in taking more affirmative actions in combating climate change, the United States remains skeptical in following this trend. Promptly after taking office in 2001, President Bush withdrew U.S. participation from the Kyoto Protocol that indicated no further commitment in future climate talks on the regulation of GHGs emissions (Rosencranz and Conklin 2010). On the other hand, effort in achieving an overarching national climate policy in the U.S. remains stalled. The Waxman-Markey bill attempting to establish a “cap-and-trade” system for GHGs failed to pass

in the Senate (Rosencranz and Conklin 2010). Furthermore, recent changes in the U.S. political landscape as the result of the 2010 mid-term election have backtracked much of the progress made in confronting climate skeptics (Hymas 2010; Mims 2010). Nevertheless, the lack of national policy has not prevented grassroots climate leadership in the U.S at sub-national levels including regional, states, municipalities, public and private sector institutions, and non-profit organizations (Fisher and Costanza 2005; Knuth et al. 2007; Bushinsky 2010).

The lack of national climate policy has opened up the opportunity for subnational actions and leadership due to the federalist structure of the United States (Bushinsky 2010). Several states have taken the initiative in creating and implementing their own policy framework in their effort to reduce their GHGs emissions, including the Regional Greenhouse Gas Initiative (RGGI), Western Climate Initiative (WCI), California's Global Warming Solution (AB 32), and the Midwest Greenhouse Gas Accord (Fischer and Costanza 2005; Bushinsky 2010). In addition, local institutions and non-governmental organizations (NGOs) are also taking affirmative steps in addressing climate change issue. The American College and University President's Climate Commitment (ACUPCC) is an outstanding example that demonstrates a collaborative effort of more than 600 institutions of higher education across the U.S. in committing to make their campuses climate neutral (Knuth et al. 2007). Moreover, there is a plethora of environmental NGOs (ENGOS) across the country that are engaging in climate policy advocacy and working toward finding a solution to the climate crisis. Numerous studies have attempted to assess the impacts of these activities in contributing toward the sub-national movement in mitigating climate change. Evidence suggests that the presence of these sub-national actors and their activities are effective in building a social movement to address climate change that has the potential to fill the policy vacuum at the federal level (Carpenter 2001; Moser 2007).

Among these different sub-national actors, ENGOS have increasingly played a significant role in the context of climate change debates. Carpenter (2001) notes that the presence of ENGOS in climate change activism at both macro (international and national level) and micro scale (local and community levels) has grown rapidly in terms of its distribution and influence. ENGOS contribute to climate negotiations through independent study and research that provide the framework for the formulation of climate policy. More importantly, several of these groups, especially smaller and regional-based groups, have been successful in educating and raising public awareness on the issue of climate change by organizing conferences and providing educational materials. These grassroots efforts are often from a bottom-up approach that aim to encourage local climate actions, as well as change toward sustainable and climate-friendly behavior on a personal level.

Given the wide range of their work, ENGOS have not only a tremendous potential to influence climate legislation at state and national levels, but also the capacity to collaborate with other sub-national actors to foster grassroots climate actions. Recognizing the significant role of ENGOS in the context of U.S. climate activism, this report highlights some of these issues through an overview of the Massachusetts Climate Action Network (MCAN) – and their annual Climate Action Conference.

Objectives

The goal of this group project was to assist the Massachusetts Climate Action Network, a local non-profit organization working to support regional climate policies and local community actions, in advertising and promoting student involvement for their annual conference that was held this year at Clark University in Worcester, Massachusetts (MCAN 2010). Under the guidance of Susan Altman, the Outreach and Program Manager of MCAN, we were able to formulate the following objectives according to the three main components of the projects, including pre-conference planning, on the day of the conference logistics, and post-conference follow-up. In pre-conference planning, the objective was to use various forms of media to advertise and encourage participation from the Clark community, Worcester consortium colleges, and the general public in the Worcester area. On the day of the conference, the objectives were to help MCAN in their logistical needs and ensure efficient coordination among the volunteers. An additional objective the project involved creating a follow-up to the conference as a resource for the participants. Materials related to the conference such as the programs, workshop titles, and video of keynote speakers are made available on this wiki page¹.

Background

Massachusetts Climate Action Network (MCAN)

The Massachusetts Climate Action Network (MCAN) is a non-profit grassroots organization based in Boston, Massachusetts. The organization has 43 chapters within Massachusetts, including one here in Worcester. MCAN promotes climate action on three levels: state, community, and individual level. One of the primary missions of the organization is to strengthen regional and state climate policies (MCAN 2010). MCAN works with state leaders to encourage strong policies to address climate change. As an example, the organization holds an important role in the development of the New England Regional Greenhouse Gas Initiative (RGGI) agreement, which currently includes ten Northeastern and Mid-Atlantic states. In early 2009, RGGI began to operate as the first mandatory U.S. cap-and-trade program for carbon dioxide (Bushinsky 2010). Governor Deval Patrick signed the agreement in January 2007 committing his state, Massachusetts, to join RGGI (Pew Center 2010). MCAN has also been a strong supporter of the adoption of a Climate Action Plan for Massachusetts. The organization works with many allies in order to build a strong network of environmental organizations within the state, including Clean Water Action of Massachusetts, Environment Massachusetts, the Global Warming Education Network, HealthLink, and Mass Energy Consumers Alliance, among others.

On a community level, MCAN has been the driving force behind its chapters throughout the commonwealth in taking action against climate change by providing educational resources and communication network. MCAN created the Low Carbon Living (LoCaL) Program in 2007, which has provided strategies for households to reduce their carbon emission by at least 10

¹ Follow this link to request access to the wiki, <http://mcanconference2010.pbworks.com/>

percent. More recently, MCAN started Cool Mass, which exponentially expands the scope of LoCaL to attempt to reduce household emissions 25% in a quarter of the households in each participating community. In addition, MCAN also encourages members and others to take personal actions that will make a positive difference to climate change (MCAN 2010).

University Context

Higher education institutions can be change agents for sustainability (Stephens et al. 2008). Through teaching, research, and interacting with local communities, colleges and universities can model sustainable practices to society by showcasing initiatives and sustainable behaviors on their campuses. Clark University is an example among other colleges and universities in the United States taking stride toward integrating sustainability elements in their institutional planning, operations, and practices (Rowe 2007). In June 2007, former university president John Bassett signed the American College and University Presidents Climate Commitment (ACUPCC) aiming to make Clark campus climate neutral (Clark University CAP 2009). According to Clark Climate Action Plan, the university plans to achieve an interim emissions target in 2015 focusing on renovation of the central heating and cooling systems, and eventually reach net-zero emissions through the on-going improvements of the energy systems and infrastructures, as well as purchasing offsets (Clark University CAP 2009). Besides recent operational and structural changes to reduce greenhouse gas emissions on campus, Clark University also encourages and supports sustainability initiatives gearing toward behavioral change among Clark students, staffs, and faculties such as the Eco-Representative and the Bikeshare students-led initiatives (Clark Campus Sustainability 2010). The George Perkins Marsh Institute² and the Mosakowski Institute for Public Enterprise³ are the two primary entities at Clark University that worked in collaboration with MCAN in planning for the conference. By hosting the 2010 MCAN Climate Action Conference, Clark University has confirmed its commitments in working toward sustainability in general and combating climate change specifically (Clark University CAP 2009).

Clark students' involvement

Because climate change education plays an integral part in the transition toward sustainability in higher education, the MCAN conference provided a great opportunity to raise awareness among the participants, not only the professionals working in the field, but also to engage Clark students with the issue of climate change and local activism in a non-academic environment. As part of the team project assignment in the Sustainable University class, the four of us were assigned to help MCAN in planning for the conference. Given that MCAN is based in Boston and this year was to be the first time the conference was being held in Central Massachusetts, having some assistance here in Worcester on the Clark campus was valuable. The

² The George Perkins Marsh Institute is a research office dedicated to explore the study of human-environment interactions (George Perkins Marsh Institute 2010).

³ The mission of the Mosakowski Institute for Public Enterprise is promote use-inspired research in addressing social problem (Mosakowski Institute for Public Enterprise 2010).

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role of our team was to fill the gap in MCAN's organizational structure here at Clark and help to engage students and get volunteers to facilitate the conference. In addition to our team who worked directly with MCAN, Clark students were encouraged to attend the conference. Students also had the chance to present climate-related research in a poster session, as well as volunteer on the day of the conference.

Process

Our project consisted of pre-conference planning, on the day of the conference logistic work, and post-conference follow-up.

Pre-conference

We had a total of four weeks to complete the pre-conference part of the project because the conference date of October 24th had already been determined in September when we began our assignment. The majority of work in the weeks prior to the day of the conference consisted largely of marketing and recruiting volunteers. In order to be efficient with the time we had, our group established a weekly work plan with specific tasks assigned for each individual of our team. Table 1 summarizes our initial weekly work plan.

Since there were a variety of tasks to be completed, different roles were assigned to each group members. Tung was the team's communication coordinator that scheduled and developed agenda for all of the group meetings. He also worked closely with Rob Johnston, the director of Marsh Institute, on the student poster presentation session of the conference. Tung also had the responsibility of promoting the conference to the graduate population at Clark University. Dania was the marketing manager of the team. She planned to tap into all the forms of marketing available on campus and the Worcester consortium colleges, including Clark Cable Network (CCN), Clark Radio (RokU), tabling at the university center to hand out flyers, and putting up posters in all the dormitories and communal meeting areas around campus. Eliza was the note taker for the team. She was in charge of working with the Regional Environmental Council to promote the conference to other colleges and university in the Worcester consortium. Eliza also kept in close contact with the Clark Community Engagement and Volunteer Center (CEV) to recruit volunteers. Finally, Melissa acted as the official spokeswoman of our group. She was mainly responsible for coordinating and communicating with the volunteers before and after the conference.

Throughout our pre-conference planning, we kept in close contact with Susan Altman. Besides logistical and structural needs in preparing for the conference, Susan wanted us to advertise and raise interests in the conference among the Clark community. She mentioned that students would have the opportunity to register for the conference at a discount rate. More importantly, the students who presented their research during the poster session or committed to volunteer during the day of the conference were waived of registration fee. We held weekly phone conference with Susan to update her on our progress. In addition, we had a webinar session for registration training in the last week prior to the conference. During this session, we

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were trained by Susan Altman via the web on how to use MCAN website to perform on-site registration for the participants who did not pre-register for the conference.

During week two, we intended to have posters and flyers printed and posted around campus. Due to lack of funding, (i.e. we had no financial support at Clark to pay for the printing costs), we were unable to complete this task. After consulting with Professor Stephens and Susan Altman, the posters were arranged to be sent to us by MCAN. Lisa Coakley from the Mosakowski Institute also helped to print the additional flyers and directional signage. On the posters and flyers were put up all over campus including the main bulletin boards at the University Center as well as all the dorms. On the other hands, additional signs for directions were put up on the morning of the conference before the attendees arrived. We also kept in touch with Susan Altman in order to finalize the student workshops as well as finalizing student volunteers.

Initially, we wanted to table for our event by handing out flyers in the University Center during the week prior to the conference. However, we were unable to book the table since tabling sessions were given to student clubs and we were not affiliated with a student club. During the last two days before the conference, two separate meetings were scheduled with volunteers for training, task assignment and pre-conference briefing.

Conference day⁴

The conference began very early, with volunteers meeting at Clark University's Tilton Hall to help set up the venue. An important task was preparing the registration tables and making the name tags for the participants that were soon to arrive. The attendees began to arrive at around 9 am and by 10 am, the conference had begun with opening remarks by Clark University's president, David Angel. Rob Garrity, the executive director of MCAN, also spoke about MCAN roots saying that the organization initially had begun with only two people. This conference was the 10th annual MCAN conference and involved 70 communities. Garrity stated that this conference was "... making it difficult for those who want status quo..." (Garrity 2010). After Garrity's remarks, guest speaker David Cash spoke about "Launching the Climate and Clean Energy Revolution in Massachusetts."

⁴ Refer to Appendix 1 and 2 for the conference agenda and lists of the different workshops. These information is also available on the wiki page (<http://mcanconference2010.pbworks.com/>)

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| | |
|---------------------------------|--|
| | <ul style="list-style-type: none">-Marketing: Clark Cable Network (CCN), Rok U (Clark Radio), The Scarlet (student newspaper), add event on Clark's Facebook Page-Work on getting volunteers from ITS for registration and general volunteers through CEV |
| Week one (9/27-10/3) | <ul style="list-style-type: none">-Calling for student poster presentation from IDCE-Contact Regional Environmental Council and other universities in Worcester-Speak with film studies professor and ask about student interest with filming conference |
| Week two (10/4-10/10) | <ul style="list-style-type: none">-Print MCAN poster and get approved for campus posting-Inform Susan Altman of any possible student workshop-Confirmation of IT volunteers that help with on-site registration-Tabling-Confirmation of all other volunteers |
| Week three (10/11-10/17) | <ul style="list-style-type: none">-Review final copy of schedule-Speak with info desk about white sign posts for directions to outside attendees-Schedule possible meeting with all volunteers letting them know what's going on |
| Week four (10/18-10/24) | <ul style="list-style-type: none">-Few days before conference: Final meeting with volunteers to make sure everyone knows what is happening-Morning of the conference: set up directional signs and make sure volunteers show up |

Table 1 – Our initial weekly pre-conference work pla

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Upon the completion of the opening session, the first set of workshops themed "Act Locally" began and consisted of workshops entitled such things as "Emphasize the Positive, Eliminate the Negative: Personality, Behavior, and Climate Change" and "Universities as Change Agents." Afterwards, the participants returned to Tilton Hall for lunch and were able to view the silent auction. There were also many vendors advertising a myriad of environmental products and services ranging from solar power to organic farming. During lunch, the attendees were able to walk around and view some of the Clark University graduate students' poster presentations on their climate-related research. These individual research projects were on a variety of topics ranging from how climate change affects happiness to research on Biomass.

After lunch, there was a second plenary session where Professor Halina Brown, who is the Environmental Science and Policy professor of Clark University IDCE Department, gave a speech on "Consumer Society to Sustainable Consumption." Proceeding this, the second session of workshops themed "Lifeboats" began where there were workshops on topics such as "Where's the Money? Funding Climate Action Projects in your Community" and "Solving the 4,000 Mile Grape: Creating & maintaining local food sources." After the second session was over, the third and last session started. The concluding session themed, "Think Globally" was a topic that encompassed the ideas of the earlier workshops. These workshops dealt with broader ideas that could be applied on a global scale, such as "Green Jobs, Green Future" and "The Next Big Things? Policy after Cap and Trade."

There were volunteers that were stationed at each workshop that kept track of the time. Since the conference was on a very tight schedule, the volunteers made sure the workshops did not go overtime. There was a bit of a mix up about where a few of the third session workshops were being held, but besides this small confusion, the conference ended smoothly with the silent auction concluding the day. Our specific job was to facilitate the flow of the conference in order to make sure that nothing went wrong. We were responsible for ensuring that the volunteers were at their respective places and were on task. We also made sure that the speakers were in the correct rooms in time for their workshops and that the conference was carried out in a timely manner.

Post-conference

Our initial plan was to have a post conference follow up either in the form of a blog, video or forum. After weighing the effectiveness of the available options, we decided to create a wiki page. A wiki page is a website which allows for the easy creation and editing of any number of interlinked web pages via a web browser⁵. Our goal is to use the wiki page as an information hub and a communication channel among the participants, MCAN, and Clark community. The wiki includes not only the information about the conference and the MCAN organization, but also Clark sustainability initiative, as well as the Sustainable University class. Once participants join the workspace, they can post success stories and actions taken to mitigate climate change, or how they have utilized the knowledge gained from the conference. Furthermore, this resource

⁵ Refer to appendix 3 and 4 for more information on the wiki page

allows the participants to reference back to the materials presented on the day of the conference, as well as using them to guide them toward making more concrete actions. This wiki page will continue to be an active resource where people can continue to enhance the content. The information on how to access the MCAN wiki page will be announced in the monthly newsletter published for the MCAN members. Follow this link to request access to the wiki:
<http://mcanconference2010.pbworks.com/>

Challenges

Since the work was split amongst the various members of the team, there were a variety of different challenges that were encountered. When we began the project, we were unaware that there were multiple parties at Clark, such as the Marsh Institute and the Mosakowski Institute working with MCAN to plan the conference. This caused us some confusion when trying to work out logistical issues. Once we contacted these other organizations, we were able to work with them to help us achieve our goals. For example, MCAN wanted to rent directional sign posts from Physical Plant; however, as students we were unable to book these posts on behalf of MCAN. After contacting Lisa Coakley, the assistant to the director of the Mosakowski Institute, she was able to able to rent the posts on behalf of MCAN.

Initially, we had problems recruiting volunteers because we did not tap into all the available resources. At first we only relied on asking the Information and Technology Services student employees at Clark University for help on registration and other members of our Sustainable University class. We did not get many responses from our peers so we then sent out a message to the graduate students of the IDCE department though a Listserv and contacted the CEV to assist us. These two methods were very effective and we received many replies from graduate students. We also wanted to encourage more undergraduate student involvement so we then contacted the undergraduate EcoReps (Ecological Representatives) group. There were a few replies but by this time we had enough volunteers.

We also encountered some problems with advertising because we were not part of any official student club or organization. This inhibited us from booking a table to be allowed to hand out flyers to the undergraduate students in the cafeteria, and also restricted us from being able to post signs in the school's University Center. Furthermore, we did not have any funding from MCAN or our Sustainable University class for printing posters to hang up around campus, which MCAN really wanted us to do. We then contacted the Mosakowski Institute and they volunteered to print the posters for us. They were able to give us both color and black and white copies.

In addition, the wiki page is currently not available to be viewed by the public. Initially, we thought that the website (www.pbwiki.com) providing the service for educational purpose would grant us access to the control feature of our wiki page. Nevertheless, we found out that in order to make the wiki page available for public view, an upgrade with a fee of \$99/year is required. Currently, the wiki page is a basic level free workspace provided by pbwiki.com that can only be viewed and edited by members only. This is inconvenient because those who want to

view the wiki would have to request access from the administration of the wiki page which is Tung Huynh, a member of this team.

Results

The conference was a success as there were a total of 165 attendees. Out of those attending the conference, there were 48 students from different universities around the area that attended the conference. Positive feedback was shared by the conference participants in terms of the overall experience of the conference and the hospitality of Clark University. By having the conference in Central Massachusetts rather than in the Boston areas, MCAN succeeded in reaching out and attract a different set of attendees in this year Climate Action Conference.

Conclusions

The impacts of human-induced climate change on the sustainability of ecosystems and human welfare on earth will continue to become more drastic and severe in the coming years and decade. Collectively taking action to reduce these risks is critical. Although a daunting problem, multiple different types of action can be taken to address climate change, but it will take a combination of both individual and collective global actions to make the difference. The Massachusetts Climate Action Network is an example of an organization that facilitates these actions. In addition to working at the state level in supporting climate policy legislation, their annual Climate Action Conference is a testimony to their bottom-up approach to fostering local and community climate actions, as well as behavior change toward sustainability on an individual level. MCAN is a vivid example of thousands of other ENGOs across the country working collectively in building a subnational network that is a formidable force in finding local solutions for the global climate crisis.

The subject for the 2010 conference was “Act Locally, or Sink Globally” reinforced the need to focus on local- and community-based climate leadership and initiatives (MCAN 2010). Since the focus of the conference was on local and community action, individual behavior was a major underlining theme. Besides raising awareness among the individuals attending the conference through the various workshops, MCAN provided the appropriate tools and knowledge to facilitate the process of fostering behavior change. In addition, the theme of the conference stressed the significance of individual behavior in the context of climate change and sustainability by promoting things such as recycling, replacing incandescent light bulbs with energy efficient CFL's, using public transportation or biking instead of cars or joining and supporting a climate initiative in one's own city or state. These are all collective actions essential to the larger grassroots movement necessary to mitigate the impact of climate change.

Overall, by working on the MCAN conference, we learned a lot about the role of ENGOs in climate activism, and we gained experience from working with a non-profit organization. We recognized that by having the conference at a higher education institution like Clark University it was a great opportunity to engage students in the discussion of climate change and climate activism.

Acknowledgement

We would like to thank the following individuals and entities in helping us throughout the process of this project.

- Susan Altman (MCAN)
- Rob Garrity (MCAN)
- Rob Johnston (Marsh Institute)
- Lisa Coakley (Mosakowski Institute)
- Clark University's CEV Center
- Clark student volunteers: Elizabeth Allen, Amanda Baker, Phong Bui, Thuy Do, Sean Fitzgerald, Xufeng Hua, Suela John, Rashid Khan, Yang Li, Zhonghui Lv, Sarah MacLachlan, Leah Melnick, and Jing Wang.
- Professor Jennie Stephens

Additional Materials

Conference agenda

- 9:00 – Registration and Coffee (Tilton Hall)
- 10:00 – Welcome and opening remarks (Sackler Science Building – Johnson Auditorium)
- 10:50 – Workshop Session 1 (various locations)
- 12:00 – Lunch, Poster Sessions, Silent Auction Bidding, Vendor Tables (Tilton Hall)
- 1:30 – Plenary Session: Keynote Speakers (Sackler Science Building – Johnson Auditorium)
- 2:45 – Workshop Session 2 (various locations)
- 4:00 – Workshop Session 3 (various locations)
- 5:15 – Raffle Prizes, Charting the Course, Networking (Tilton Hall)
- 6:00 – Conference ends

Table of workshops and presenters

| Track | Title | Presenters |
|--------------------|---|---|
| | Universities as Change Agents | Jennie Stephens , Assistant Professor of Environmental Science and Policy, Clark University Dave Schmidt , Senior Special Program Coordinator, Mount Wachusett Community College |
| Act Locally | Climate Action Starts At Home: Home-Based Carbon Reduction Strategies | Mike Cavanaugh , Biggest Carbon Loser Program, Braintree Audrey Schulman , Cambridge HEET Ashley Trull and Glenn D'Alessio, Worcester Energy Barnraisers |
| | Emphasize the Positive, Eliminate the Negative: Personality, Behavior, and Climate Change | Nick Smith , Yale Project on Climate Change Jim Nail , President, Massachusetts Interfaith Power & Light |
| | Green Communities Updates: What do YOU want to know? Where's the Money? Funding Climate | Mark Sylvia , Director, Massachusetts Department of Energy Resources' Green Communities Division Cheryl King Fisher , NEGEF |
| | Action Projects in your Community | Fred Schlicher , MCAN |
| Lifeboats | Solving the 4,000 Mile Grape: Creating & maintaining local food sources | Lyn Huckabee , DOER Lilly Lombard , Growthfood Northampton |
| | What to Expect from a Home Energy Assessment | Sharon Glenser , Outreach Coordinator, Northeast Organic Farming Association of Massachusetts Mark Donovan , CSG |

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Think Globally

How to Run a Good Meeting
The Baby Boomers are Tired Young leaders explain how to interest youth in climate action (and why you should)
Taking the Fossil out of your Fuels: Heating and cooling your house without fossil fuels
General Organizing Training
The Next Big Things? Policy after Cap and Trade

Marc Breslow, Director of Transportation & Buildings Policy, MA Executive Office of Energy and Environmental Affairs
Marlee Cowan, Co-founder of Mobilize.org

Craig Altemose, Students for a Just and Stable Future

Martin Orio, Water Energy Distributions, Inc.

Eric Friedman, Massachusetts Office of Energy and Environmental Affairs

Sarabeth Buckley and **John Beatty**, Students for a Just and Stable Future

Tom Stokes, Pricing Carbon Campaign

Jamie Eldgridge, State Senator (D-Acton)

Shanna Cleveland, Conservation Law Foundation

Country Roads and a Green Future:Low Carbon Transportation Options for Non-Urban Communities
Community Organizing: Are We Making Progress?

Gary Roux, Pioneer Valley Planning Commission

Craig Della Penna, writer and activist

Dan Allalendjian, MassRIDES

Nancy Hazard, Co-chair, Greening Greenfield

Becca King, Greenfield 10% Challenge

Wendy Penner, Williamstown Cool Committee

Lynne Pledger, Don't Waste Massachusetts

The Waste-Climate Connection: The surprising Carbon Impact of Your Trash
What to do about what we can't undo: adaptation strategies to climate change
Green Jobs, Green Future

Megan Wu, ICLEI Regional Office, Boston

John Odell, City of Worcester Energy Efficiency and Conservation

Loie Hayes, BCAN

What is a wiki page?

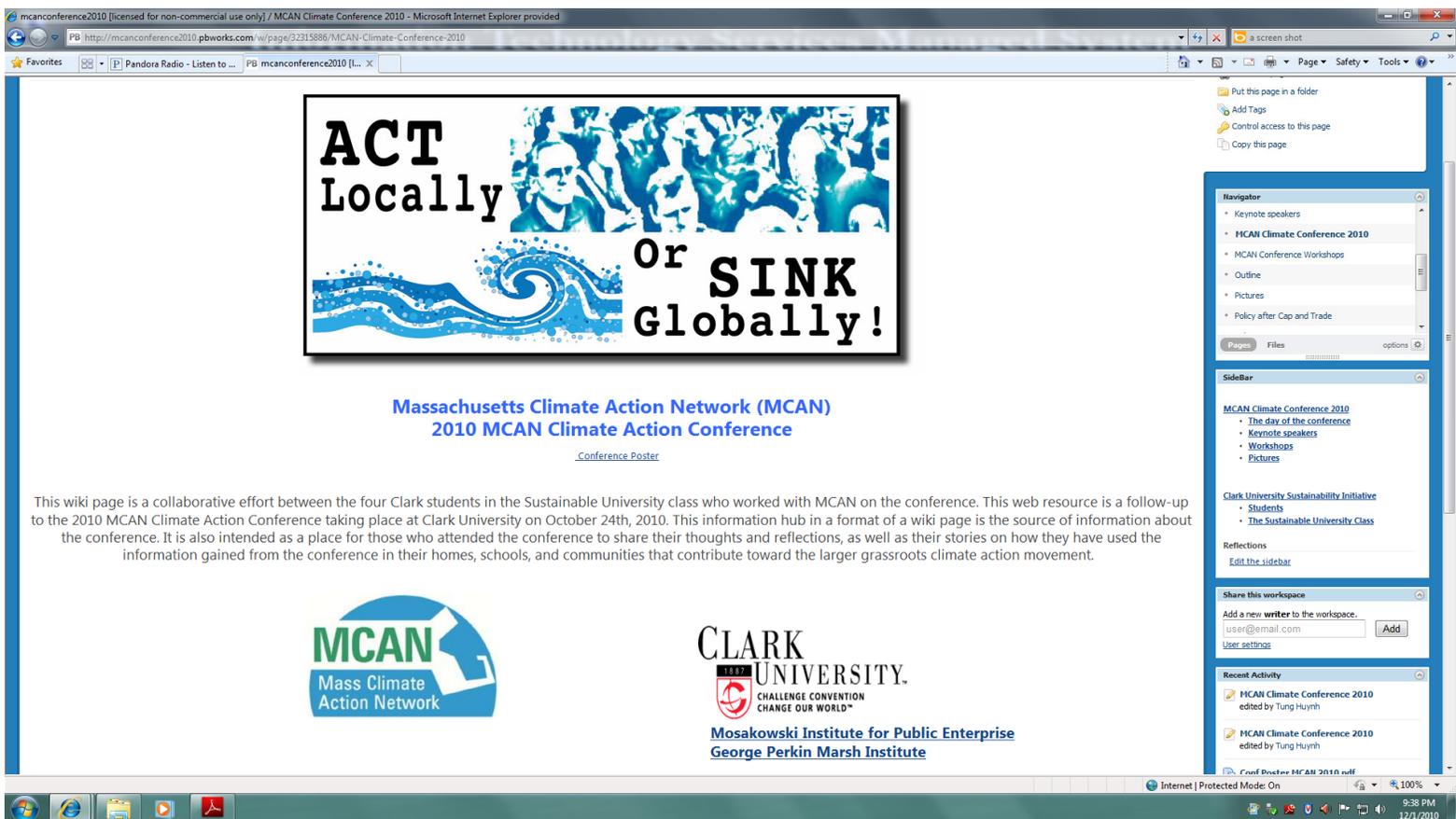
Wiki is a website that allows members of a workspace to easily create, edit, and modify of a number of interlinked web pages via a web browser. The goal of wiki is foster more effective communication and coordination among different individuals in a group. The wiki also serve as a tool for information sharing across the internet without the need of email. The users of a wiki page can also incorporate sounds, movies, and pictures and embed link to external sources on the internet within the content of any document created on the wiki. The use of wiki has significant implication to collaborative works often found in school and business environment. Since wiki provides several benefits without the hassle of acquiring technical expertise, it is an innovative method of communication, especially for team project.

Source:

EDUCAUSE. "7 things you should know about wikis." Accessed December 11, 2010.

<http://net.educause.edu/ir/library/pdf/ELI7004.pdf>

The wiki page as the follow-up resource for the 2010 MCAN Climate Action Conference



A screenshot of the front page of the wiki page. Follow this link to request access to this workspace, <http://mcanconference2010.pbworks.com/>

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The Potential for Serving Sustainable Food at Clark University

Justin Boyle, Marie Bozeman, Rebecca Hertz, Daniel Pologe

Abstract

Most of the industrial world only knows and consumes industrialized food, which is where the fast food movement comes into play. It is hard for the public to understand what sustainable food is when they are not necessarily concerned with where their food comes from or with the environments which these foods are produced in. Many universities and organizations have tried to send out messages to the public but the public is hard and fast with their ideals and behaviors. Our team hopes to be able to change the behaviors, attitudes, and values of the Clark community with our project. Our team has focused this semester on various initiatives related to food sustainability on campus. This report summarizes what we have done and what we have learned related to the sustainability of the food system at Clark. Specifically we present results from a survey we conducted of the student body and we report on a baseline assessment of food Sustainability developed by the non-profit company, Real Food Challenge and completed by Clark's dining services, which is run by Sodexo Corporation.

Introduction

The corporate food industry, prevalent in today's society, offers inexpensive food (Shaffer, 2010). However, such low prices do not reflect the true expenses put forth to maintain the agriculture involved or the environmental costs. Large scale agriculture limits consumers' ability to know how food is grown, how safe it is, and whether farm communities are enhanced or harmed by its production. Therefore, local, community-based food systems are an alternative to the global corporate models in which producers and consumers are separated from one another. A local food system encourages the idea of the consumer as an active participant, or co-producer. This model focuses on relationships among the food producers, processors, distributors, retailers and consumers and increases knowledge about the characteristics of our food (Shaffer, 2010). The development of local food systems is not only about environmental impacts but also the social and economic benefits it promotes.

The notion of sustainability is part of this growing movement in conjunction with established organizations such as Slow Foods and the Real Food Challenge dedicated towards creating a more connected food community. Food sustainability is an environmentally conscious effort focused on local-maintenance, production and distribution of food including the fair and humane treatment of all food, plants and animals, as part of a greater initiative to make the planet a greener and more mindful society.

With such efforts being placed on food quality and the impacts of food production on the environment, the emphasis on localized food has emerged as an increasingly significant issue amongst colleges and universities across the country. Many institutions are adapting campus

policies on how they obtain food-challenging suppliers to increase the level of accountability in relation to food and its impact on the environment. Meanwhile, food providers additionally are confronted with the task to ensure their goods fit into the politically correct mold while maintaining a respectable image. Therefore, the public has put forth demands expecting colleges and corporations alike to become more sustainable in their actions and as such the institutions are forced to respond with measures to meet the requests (Arias, 2009).

Food sustainability can happen in a variety of ways, such as sourcing food locally, which cuts down on unneeded transportation, purchasing organic food that does not rely on pesticides or preservatives. Eating sustainable can also help the community by supporting local farmers and gardeners and allows consumers to know where their food is coming from. At universities there are multiple challenges enhancing the sustainability of campus food systems. At Clark University, in Worcester Massachusetts, there have been minimal initiatives to promote sustainable food choices, but there is growing interest and pressure to expand the effort. Our team was motivated to improve the current availability of resources in relation to sustainable food and focused on expanding the level of understanding of both the current efforts and potential future changes in enhancing the sustainability of the food being served at Clark. The goal of this project was to compile the Real Food Challenge survey and distribute the results to the food policy council. This report aims to provide the following information as we focused on our groups' effort to increase awareness about the initiatives as both strengths and weaknesses—detailing our partnership with the food policy council. Along the way we were able to find more information regarding other campuses projects and policies in promoting a higher degree of environmentally conscious decisions.

Background

When beginning this semester long project, the Sustainable Food Team wanted to learn more about what makes food sustainable. To do that the Slow Food Organization and The Real Food Challenge were researched. These two organizations are trying to change the public's instilled behavior that the most important part of food is the convenience (Slow Food International, 2010). The Slow Food movement encourages eating organic and locally sourced food because it will benefit the consumer and the producer. Their vision is for everyone to have access to healthy, great tasting food, that's good for them and the planet. Started by Carlo Petrini in the 1980's (Menely, 2004), Slow Food is the idea that people should “take pleasure in the selection, preparation and consumption of food, to cultivate one's taste for distinctive products, hence supporting the producers of distinctive local products.” (Menely, 2004; 170). The Real Food Challenge has taken the idea of Slow Food and made it into a social movement. Comprising of mostly young people, students in particular, the Real Food Challenge wants to make a lasting social change to a sustainable food system through social channels such as universities. (Real Food Challenge, 2010).

The Real Food Challenge (RFC) has been successfully implemented in many colleges. The RFC supplies all the materials needed for a school to begin their transition to sustainable

food. First an institution must complete the Real Food Campus Baseline Assessment which asks many questions ranging from the budget the institution spends on local or organic food to the treatment of workers. If the institution gets enough information they can plug it into an excel worksheet, called the Real Food Calculator, that will find the percentage of the food that is “real” or sustainable (Real Food Challenge, 2010).

Clark University is contracted with the dining service company Sodexo. The five year contract is ending in May 2012, so this is prime time to try and get more sustainable food served at Clark (Wykes, Dec. 1st). Currently on campus there are protests against the unfair treatment of workers by Sodexo, and in the contract there is very little on the topic of sustainable food, so it seems that Sodexo does not place sustainable food or fair working conditions as a top priority. It is a company far from the views of the Slow Food movement and the Real Food Challenge.

The Sustainable Food Team contacted many schools that have used the RFC so we could make potential models that could be used here at Clark University. Other schools with Sodexo seem to be in this same situation as Clark University. At Keene State College, they have cage free eggs and usually only have local produce at one meal per week and they only use fair trade coffee, just like Clark (Keene, 2010). But at other schools contracted with Sodexo, like the University of Vermont, they are very sustainable minded. There they have an Office of Sustainability, they buy high percentages of local food, and Sodexo made a Sustainability Gallery on the campus and takes interns for assisting on more local food purchasing (University of Vermont, 2010). This shows that Sodexo has the capabilities of becoming more sustainable.

We saw that there were some similarities between the most sustainable colleges. The most sustainable models were found to be those that were self-operated, like Middlebury College, UMASS Amherst and Tufts, to list a few. Also, the more sustainable ones have an on campus garden, such as Brown University and Sterling College. Good models buy high percentages of local food, like Bates College who buys 30% locally or Middlebury College that buys 25% locally. Composting is also a great way to be sustainable, Bates College composts 80 percent of its dining wastes, while Amherst gives eight tons of food each month to a local farmer to be converted to compost. There hasn't been much done at Clark University in the terms of sustainable food, but it does share some similarities to these models.

Clark University has both an urban garden and an arboretum, and they have also agreed to be an end buyer of the Main South farmers market. Clark composts food wastes too, but sends the waste to an off campus site, which isn't the most sustainable way to handle it. They also went tray-less three years ago, trying to reduce the amount of food wasted and energy wasted cleaning the trays. But with such few actions taken for food sustainability, much has to be done in coordination with the Clark Food Policy Council to asses a possible sustainable food model. (Clark University, 2010)

The Food Sustainability Team worked closely with a new group on campus, the Food Policy Council, headed by professor Jody Emel. It is currently in it's development stage, consisting of some graduate students and undergraduate students from an assortment of sustainable groups on campus, such as Food Truth. Through the Food Policy Council we were

able to complete the short-term goal of completing the RFC Campus Baseline Assessment with the Dining Service Manager Stu Gerhardt and Business Manager Paul Wykes. Longer term goals for the Food Policy Council include the possibility of switching from Sodexo to another dining service or being apart of the new Sodexo contract so it can include more on sustainable food purchasing.

Like the Sodexo contract, there is very little mentioned on sustainable food in Clark University's Climate Action Plan. The only things concerning food mentioned is that Clark buys Energy Star efficient vending machines, refrigerators, dishwashers and any equipment used in the food services. It also mentions the tray-less dining and that it purchases local food, but it does not give what percentage of the entire food budget is local or what they define as 'local' (Clark Action Plan, 2009). It is easy for a school to seem like they have a strong sustainable food system, so it is necessary to have the solid facts about what is considered local and exactly what sustainable food is bought.

Process

Our team began the semester with ideas about a few different strategies and various approaches that we could take for our project to bring about change on Clark's campus in the area of food sustainability. Our initial aspirations at the beginning of the semester were ambitious and idealistic. We realized early on that our long-term goals should be realistic and we were unlikely to be able to accomplish all that we had originally hoped to accomplish. We developed short-term goals and long-term goals for our team project.

Our short term goal, which came out of the first meeting with the Food Policy Council at Clark University on September 22, 2010, was to conduct research about sustainable food initiatives at other New England college campuses. We wanted to learn about the structures and initiatives that other food policy councils have implemented or are currently implementing. In addition to internet research, to gain further knowledge about these models and initiatives, our team contacted the food service coordinators at several universities. The long-term goal for our team project was to use this research to work with the Food Policy Council to develop a proposal or a formal policy that would include recommendations about objectives and structures that could be used to bring more local, sustainable, and/or organic food to the Clark campus. Another long-term goal that came out of the Food Policy Council was to complete the Real Food Challenge Real Food Calculator. This calculator will be explained later on in this section.

Our first meeting with the Food Policy Council was on September 22, 2010 and included about 10 people who are interested in campus food sustainability on the Clark campus. The Food Policy Council has provided our team with a valuable network of actors within the community who are working towards bringing about food sustainability change on campus. The Food Policy Council consists of members of the undergraduate and graduate student body who are interested in food sustainability within Clark, a faculty advisor, Jody Emel, who is a professor in the Geography department, and a staff member of Clark's dining services, whom is employed by Sodexo. The Food Policy Council meetings occurred every two weeks throughout the fall 2010

semester, and two of the four members of our team attended all of these meetings and informed the other members of the team of the progress and discussion at each of these meetings. Currently, the Food Policy Council has a website open to the public that provides a little bit of information on what the council has done with semester.⁶ The website has minimal information right now but as the Food Policy Council becomes more concrete, so will the website. A particularly important Food Policy Council meeting that our team attended occurred on November 10th, 2010. In this meeting, we were able to meet with Stuart Gerhardt, who is the Dining Services Manager for Clark University, Paul Wykes, who is the Business Manager for Clark University, and Dennis Gagne, the Head Chef of Dining Services at Clark University. During this meeting, these staff members agreed to respond to the questions within the Real Food Challenge Baseline Assessment that the non-profit organization “Real Food Challenge” created. This baseline assessment asks questions about different categories including basics on food purchasing, social responsibility efforts taking place, meal plans, and interests in sustainable purchasing (Campus Food Baseline Assessment, 2010). The questions are related to food sustainability and fairness in the Dining Services here at Clark University. Much of this information is not easily accessible information, so the input of the dining service manager, the business manager, and the head chef are required to complete this assessment.

Another important date for our team project was December 1st. On this day, we had another Food Policy Council meeting with Paul Wykes, the business manager at Clark University. Before this meeting, Stuart Gerhardt and Paul Wykes had completed the Real Food Challenge Baseline Assessment that the Food Policy Council gave to them three weeks earlier. This survey is a required first step before Clark can use the Real Food Calculator. This survey is a tool that can be used to approach a campus dining service provider to begin preparing for an assessment with the Calculator. This survey helps set up a framework for collecting data for the Real Food Calculator (Real Food Challenge, 2007). The Real Food Calculator is a tool to track institutional food purchasing. The Real Food Calculator Guide provides a list of criteria that determine what qualifies as “real food.” We define real food as food that has 4 attributes: local, fair, ecologically sound, and humane (Real Food Challenge, 2007). Although the assessment was completed, there were a few questions and issues left unanswered. Our team and the Food Policy council still have many questions about the answers we received from Paul Wykes and Stuart Gerhardt.

To gain further knowledge of what is going on around Clark University in relation to food sustainability, members of our team attended a Difficult Dialogue event sponsored by on campus on September 28th, 2010, called *Slow Food Worcester* (Clark University, 2010). This event included local chefs from restaurants in the area and dining service managers from colleges in the Worcester area. Casey Burns (Regional Environmental Council), Alec Lopez (Armsby Abbey), Julius Jones (REC YouthGrow), Marty Dudek (College of the Holy Cross), Paul Booras (Flats Pizza) all came together to share their experience and wisdom for this event (Clark

⁶ <http://clarkfoodpolicy.wordpress.com/>

University, 2010). The event also included reports from the field, dialogue circles, resources on how to “slow” your food and a tasting of what Worcester has to offer (Clark University, 2010).

In addition, our team developed and implemented a survey so our team, the Food Policy Council, and the dining services at Clark University could be better informed of what the student body actually wants in the Dining Hall in relation to food sustainability. Our team was able to create this survey online through the Tiger Survey website.⁷ Our team gave the survey out to the student body through two different outlets: the first being through *Facebook* and the second involved setting up a table inside the cafeteria for students who are specifically on the meal plan to fill out the survey on our team’s individual laptops. Since we wanted to make the survey very simple for students to fill out, the complete survey had only three questions. The three questions we asked are: 1) How important are the issues of sustainable, local, and organic food to you?; 2) How willing are you to pay more for a meal plan that includes a higher percentage of local, sustainable, and/or organic food?; and 3) If the food in the Dining Hall was more local, sustainable, and/or organic would you be inclined to eat there more often? (If you are not on the meal plan, would you consider purchasing one?). Also, we designed the survey so that at the end of the survey, people had an opportunity to leave any additional comments or suggestions they have for our team or in general about dining services at Clark University.

Our team faced a few challenges and delays throughout the semester. Our first delay was associated with the writing of our proposal for our project. The first meeting with the Food Policy Council happened the day the proposal was due so we postponed the completion of our proposal until after this meeting. One challenge throughout the semester was our reliance on the Food Policy Council. The whole semester our team worked side by side with the Food Policy Council so we had to coordinate with their scheduled meetings and their pace of action. However, coordinating with the Food Policy Council brought our team connections and a framework within which we could do our work. The Food Policy Council limited our abilities to do outside work that was not related to what the Food Policy Council was trying to achieve. Another challenge we had was related to the fact that Clark’s Sustainability Coordinator left Clark this summer, so the campus-wide Sustainability Task Force has not met all semester. The Food Policy Council is a sub-committee of the Sustainability Task Force, so the influence and connectivity of the Food Policy Council was reduced this semester because the Sustainability Task Force was not meeting and was not active. Another challenge related to the early development stage of the The Food Policy Council. This group was just initiated this semester, so the group has not yet formally created their policies or articulated clearly what they stand for and hope to achieve as a council.

Results

As mentioned previously, in addition to the feedback from Clark Dining Service representatives, we also set out to judge the receptiveness of Clark students to the principles of S.L.O. food and

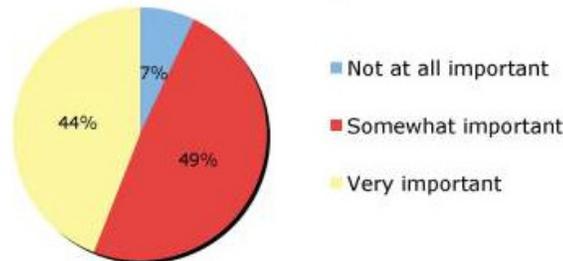
⁷ <http://www.tigersurvey.com/Survey.aspx?id=175753>

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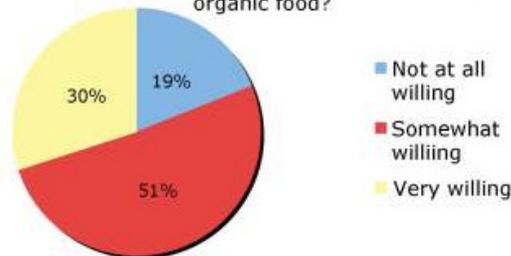
the possibility of implementing them at Clark. In particular, we were interested in determining what the reaction would be to an increase in the price of each meal plan if students were offered more sustainable, local, and organic fare. The three question survey we conducted received 234 responses with the following quantitative results.

Clark - Food Survey Nov 2010
[n=227]

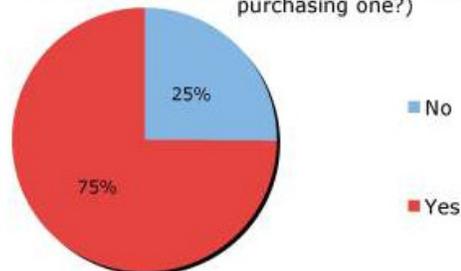
How important are the issues of sustainable, local, and organic food to you?



How willing are you to pay more for a meal plan that includes a higher percentage of local, sustainable, and/or organic food?



If the food in the Dining Hall was more local, sustainable, and/or organic would you be inclined to eat there more often? (if you are not on a meal plan, would you consider purchasing one?)

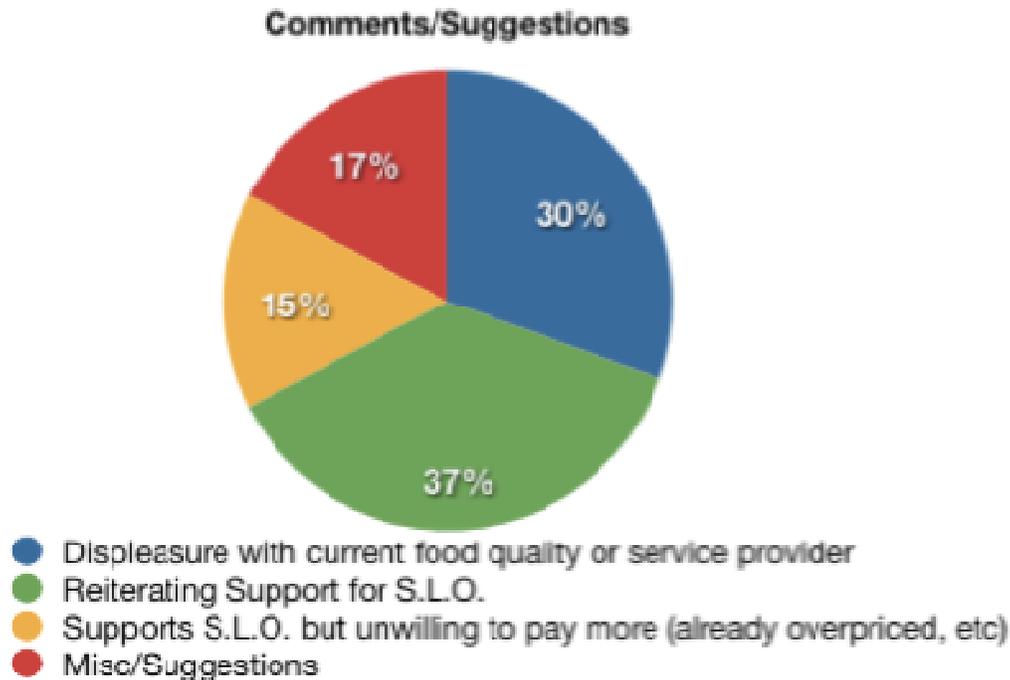


Becca Hertz

In addition to the three multiple choice questions, the survey also offered an opportunity for respondents to make additional comments and suggestions. In order to facilitate a more productive discussion around the results, we grouped these responses into several broader categories. The categories are: Displeasure with current food quality or service provider; Reiterating Support for S.L.O.; Supportive of S.L.O. but unwilling to pay more (already expensive, overpriced, etc); and Misc/Suggestions. While some of the responses included features of multiple categories, the stand-out result was that, regardless of their willingness to

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spend more, the majority of written responses (52%) clearly stated support, with an additional 17% showing implied support with suggestions ranging from dining services-sponsored farmers markets to fresh produce in the Bistro. While not the focus of our project, the general negative opinions of both dining hall food quality and the dining services provider Sodexo should be noted, with a full 30% of the comments relating entirely to student's displeasure with the current operation, and additional comments scattered throughout the other categories (particularly in relation to student's unwillingness to pay more).



Conclusions

We were pleased to find through the results of our investigation, that there is a great deal of support for local, sustainable, and organic food on campus from nearly every demographic, including the student body, faculty, staff, and our dining services contractor. Moving forward, there will be plenty of opportunity to integrate the aforementioned principles into Clark's dining operations, as well as the underlying culture at Clark.

The next step in this process is completing the Real Food Challenge baseline assessment, as well as scrutinizing that data through the use of the Real Food Calculator. The Food Policy council will need to recruit more members and gain both student and administrative support in order to establish themselves in a more official capacity, and to accelerate the process of developing a comprehensive and lasting food policy for Clark.

While future challenges lie in the ability of the Food Policy council to develop a working relationship with Clark Dining Services, over the past semester, the two parties have built a solid foundation on which we believe a strong food policy can be built.

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Sustainable Fund: Creating Awareness about Green Initiatives in Clark

Mohamad Reza Brooks, Mary Kathryn Cleminson, Sr. Faustina Ganaa, Esther Faith Tendo

“The sustainability challenges that human society is grappling with are increasingly urgent as the rates of change in many dimensions are accelerating. Given the urgency for confronting sustainability challenges in diverse and diffuse ways, opportunities are emerging for different societal stakeholders and institutions to engage in new ways. Institutions of higher education have a particularly interesting potential in society to facilitate societal responses to the plethora of sustainability challenges facing communities around the world.” (Stephens, 2010)

Abstract

The focus of this project is to investigate the potential for a sustainability fund to be incorporated into Clark’s budget in order to finance sustainable initiatives on and around campus. Its purpose is not to implement a new operational system; it is to research and report on the potential structures Clark can implement in order to become a more environmentally sustainable campus. We chose to define environmentally sustainable projects and initiatives as those which do not contribute to environmental degradation but instead encourage energy saving, food and water conservation, a reduction in emissions, and raise awareness about how to address these issues on an individual and institutional level. Our research was conducted in two phases: general research and compatibility assessment. In the first phase we investigated and reported on the financial mechanisms used by other colleges and universities to fund sustainable initiatives on their campuses. In the second we interviewed prominent administrators and alumni to determine the compatibility of the most prominent mechanisms into Clark’s financial structure and made recommendations accordingly. The results of our research can be used to spark discussion about funding sustainability on college campuses and modeled as a foundation for further investigation into the creation of a sustainability fund.

Introduction

Climate change is a problem that has been put on the bottom of the ‘to-do’ list for too long. “At the heart of climate change is the greenhouse effect, in which molecules of various gases trap heat in Earth’s atmosphere and keep it warm enough to support life. Carbon dioxide and other “greenhouse gases” (GHGs) are an important part of Earth’s cycles, but human activities are boosting their concentrations in the atmosphere to dangerous levels. This results in rising global temperatures and an unstable climate that threatens humans, economies, and ecosystems.” (McKeown and Gardner, 2009). The United States alone emits approximately 6000 million tons of CO₂ in a year (McKeown and Gardner, 2009). The effect of climate change is a

global problem which has contributed to various natural disasters all around the world even if the country is not one of the top contributors of CO₂. In 2008 Clark University alone emitted an estimated 17,464 Metric Tons of Carbon Dioxide Equivalent (MTCO₂e) into the atmosphere (Clark University, 2009). The two largest contributors to these emissions were boilers (5,632) and purchased electricity (4,278) – factors determined in building design (Clark University, 2009). Climate change addresses all human beings, and as part of the global community actions towards reducing our CO₂ should be worked upon. Also because this is a global problem collaboration between different groups and organizations is key to solving reduction of green house gases.

Universities play an important role in environmental sustainability as universities are institutions which have the ability to shape and maintain long term projects. Gerry D'Amico also highlighted in his discussion with the Sustainable University class the importance of maintaining good universities as they are institutions that last for a long time. D'Amico further discussed the importance of having a strong academic center in place in order to attract various businesses and also to attract people with ideas.

One place where research and initiatives are created that can tackle a global problem is universities. Recent surveys show that 85 percent of people living in the United States believe that human beings should coexist with nature (Leiserowitz, Kates, & Parris, 2006). There are currently 7,145,000 college students in the United States, which accounts for over 2 percent of this population (U.S. Census Bureau, 2008). This is where universities play an important role in educating students about the problem and possible solutions as universities are places where sustainable practices can be experimented; however if the university does not supply adequate information about the different programs and initiatives how are students suppose to learn? To create a successful institution of sustainability into the college culture does not depend only on the development and implementation of large-scale campus sustainability initiatives. It should range from large to small-scale initiatives including academic activities, promotion of sustainability best practices and other strategic initiatives such as incentive programs that will have the effect of creating a sustainable culture in the university campus. However financial resources are always a challenge. The creation of a successful integration of sustainability into the college culture depends not only on the development and implementation of large scale campus sustainability initiatives. Effective integration is also likely to include a range from large to small scale initiatives including academic activities, promotion of sustainability best practices and other strategic initiatives such as incentive programs that will have the effect of creating a sustainable culture in the university campus. However financial resources could pose a challenge. The current situation of a nonexistent system for donation and distribution of financial support for sustainability initiatives coupled with lack of coordination among such sustainability programs pose a major problem. Without funding, a university's power to move as swiftly and effectively towards a new direction will be hindered (Cummings, 2009: pg 110). There is a need for some kind of financial support to specifically promote sustainability initiatives on campus and to also encourage members of the Clark community to initiate sustainability

projects. Consequently, the centrality of finding a consistent funding stream to “resource” the objectives of sustainability cannot be overemphasized. Cummings (2009) presents that in the cases of Arizona State University (ASU) and University of New Hampshire (UNH) private endowments played a key role in thrusting the schools to the top of the national list of achievement in sustainability. This is where a program that directly deals with all sustainable projects on campus would be helpful as everything would be organized and funded by one program that connects all aspects of the environment and its problems. Given the advances in sustainable technology that have emerged in the past few decades, it is reasonable to believe universities will implement these technologies given their position as forward-thinking institutions. Admittedly, exploring options for the incorporation of a sustainability funding structure in Clark University, is a strategy that can encourage, support and fund sustainability initiatives programs. It will potentially create awareness, educate, inform and prompt people about environmental and sustainability issues which simultaneously enhance behavioral change. Therefore, its ability to reduce barriers to behavior change while exposing benefits makes it a worthwhile consideration.

Background

Why do colleges want to address sustainability? In our research we identified a number of motivations for colleges and universities to incorporate sustainability in to their campus structure. These include everything from scoring well on national ranking systems to attracting the most competitive student body around. Below are detailed descriptions of the most prominent motivations we discovered:

Ranking Systems

Clark’s reputation for being a responsible community where creative sustainable ideas are encouraged is one reason why a sustainability fund might be considered. The College Sustainability Report Card is a system of ranking made to look at different colleges and compare and grade them in how environmentally sustainable they are. This method of ranking colleges is a great way to create incentives towards sustainability, but what does it mean to get an A on the college sustainability report card(Executive Summary, 2007). The report is based on nine categories which are: “Administration, examines sustainability policies and commitments by school administrators and trustees; Climate Change & Energy, looks at energy efficiency, conservation, commitment to emissions reductions, and use of renewable energy on campus; Food & Recycling, evaluates dining services policies, including recycling and composting programs; Green Building, recognizes campus-wide green building guidelines and green building design for new and existing buildings; Student Involvement, looks at student participation in sustainability initiatives and support for these activities by school administrators; Transportation, focuses on alternative transportation for students, faculty, and staff, as well as alternative fuel or hybrid technology for campus fleets; Endowment Transparency addresses accessibility to endowment investment information and shareholder proxy voting records;

Investment Priorities, considers prioritization of return on investment, investment in renewable energy funds, and investment in community development loan funds; Shareholder Engagement, looks at shareholder proxy voting practices, including opportunities for student, faculty, and alumni participation” (Sustainability Categories, 2007). These categories are graded through surveys and research on the colleges.

Like all ranking systems, the College Sustainability Report Card has flaws as David Orr’s chapter on Rating Colleges explains ratings are just a means to satisfy ones needs to judge a certain topic (Orr, 2004). However if rating colleges helps fuel disagreements and hence lead to highlighting the topic of sustainability it will create a chance for people to talk and comment on that certain topic.

Reduce Environmental Impact

One of the major components to why colleges and universities should support sustainability initiatives on campus is to support their efforts in pursue carbon neutrality, i.e contributing to reduce overall global emissions. In terms of carbon dioxide most of this is produced through use of fossil fuels which is used to fuel boilers and in general electricity towards the campus (Clark University, 2009) . In order to reduce environmental impact the use of electricity should be switched to renewable energy such as solar and wind, yet this transition is hard to achieve as the current structure of running an institution is through the use of these fossil fuels. Over the years there has been a couple of technological breakthroughs in which equipment such as boilers and energy producing machines have become more efficient in terms of how well they are able to produce more electricity by using less fossil fuels (Clark University, 2009). It may be hard to switch are dependence of our fossil fuel use, but if we transition and make colleges make the first steps then there is a chance in where a bigger movement towards green technology can be achieved. For example from the greenreport.org University of Minnesota was able to cut its energy use by 5% in one year (Sustainability Categories, 2007).

Leaders in Environmental Technology

Universities such as UCLA have approached sustainability as an opportunity for technological growth and excellence. It is known as a “living laboratory for climate and sustainability research” as it builds and incorporates its discoveries directly into the campus (UCLA 2010). As a result UCLA has become a renowned leader in environmental technology development and attracts leading students from around the globe eager to join the cause.

Appeal to Prospective Students

It is generally accepted that students want to attend universities with cutting edge educational, research, and developmental opportunities. This is made evident by the growing number of college review books, magazines, and information geared towards perspective students each year. As the movement towards sustainability gains momentum, the degree to which it is incorporated into campus life and structure will undoubtedly contribute to the

competitiveness of that school. The University of Washington even incorporates their progress towards sustainability into their admissions pamphlets and website by featuring recent projects and up-and-coming initiatives in order to attract a competitive student body interested in furthering their mission (UW, 2010).

Catalyze Sustainability Projects

As we learned in our talks with Gerry D'Amico, universities are unique in that they possess the ability to think and plan within a larger time frame than most other institutions and organizations (D'Amico, 2010). This operational longevity means that universities are able to invest in projects and developments that may not reap immediate financial gains or rewards. For this reason, it is in many ways the responsibility and even duty of universities to implement new sustainable technologies in order to set a precedent for other institutions and act as a model for the surrounding community. This mindset has been pioneered by Grand Valley State University whose Sustainable Community Development Initiative seeks to provide Grand Valley administration, faculty, staff, students, and community stakeholders with the required skills and capabilities to become better stewards and responsible global citizens in the workforce, communities, and family life (GVSU, 2010).

What is Clark doing?

Clark has developed the Climate Action Plan to outline a strategy to reduce emissions by 20 percent below 2005 levels by 2015 and to achieve carbon neutrality by 2030 (Clark, 2009). Though this represents a positive attitude towards environmental protection, it does not necessarily translate into action (Leiserowitz, Kates, & Parris, 2006). This is the case in part because Clark does not have a financial mechanism to fund the large-scale sustainability initiatives outlined in the Climate Action Plan. We propose to change this behavior by investigating a variety of funding structures for sustainable development currently in place at comparable universities and presenting our findings to the Sustainability Task Force. The purpose of this project is not to raise money for a sustainability fund; it is to outline existing methods of fund-raising which can be adapted to operate within Clark's financial structure with the help of the Sustainability Task Force. The end result will be a university whose efficiency reflects the intellect and motivations of the people that use them (Orr, 1994).

Process

For Phase 1 of the project our group looked upon funding as a basis to support various environmental sustainability projects our group looked at various funding mechanisms in order to see how a college can function with an allocated budget towards sustainability. Phase 2 was focused on sharing ideas with key individuals about the idea of having a sustainable fund and hearing what they had to say about our group's ideas as well as sustainability in general on the Clark campus.

Phase 1: Funding Mechanisms

Revolving Loans

One key funding mechanism that is used in various colleges is the revolving loan fund. A revolving loan fund is when funds are allocated to a certain pool where the money is lent out to people who have been approved to work on certain projects; then the money is paid back with small interest through savings made in the project (Serra 2008). One university that has a fully functionally revolving loan fund is Harvard. Harvard's revolving loan fund has funded various projects on campus and has effectively fed the savings from those projects back into the fund. This helps manage its ever growing sustainability programs on campus and Harvard has started to work on educating its surrounding community through activities done through the sustainability program. Using the revolving loan fund Harvard is able to create incentives to start up green programs aimed towards making the university more environmental sustainable by giving it support as well as funding (Sustainability at Harvard, 2009). The fund at Harvard comes from the university itself through allocation of the general fund into the sustainability fund; the amount allocated is \$12 million (Sustainability at Harvard, 2009). Anyone is eligible for the money in the revolving loan fund as long as they fill out a form that is available in their website and have taken the time to talk to the sustainability board (Sustainability at Harvard, 2009). There is certain criterion in which one has to follow to gain the funding as well as a set of rules such as a payback period of less than 5 years (Sustainability at Harvard, 2009). In Harvard the fund is administrated through the sustainability office, which consists of both students and faculty. This sustainability fund has been around for a long time so it has had the time to grow over the years, making it a good example of revolving loan system (Sustainability at Harvard, 2009).

Student Fees

One option of providing income to a potential sustainability fund involves student fees. This option would require adding an optional fee on the tuition bill that would be put in the sustainability fund. This model was pioneered by schools like Evergreen State College, University of Washington, and UCLA, who adds an additional \$12 Green Initiative Fee to their tuition bill to fund sustainable development (UCLA, 2010). The benefits of adding this fee are that it 1) directly ties students to the university's investment in sustainable development and 2) it is reliable because students and their tuition are a constant variable in universities. Potential drawbacks are that those paying the fee may resist the effort to add additional fees to their already sizeable tuition bill. The fee may also conflict with the financial structure of the institution. Lastly, there may be debate surrounding the purpose of the fee given that not everyone supports sustainability or the initiatives associated with it. One of the ways to address these barriers would be to make the student fees optional or to clearly state and outline what the fee is being used for and how it will benefit the students.

Small Business

The aim of this enterprise is to contribute to sustainability fund through the profits made from the business. This gives student initiatives and projects a long lifespan and a sense of ownership; plus it encourages students to creatively get involved in sustainability initiatives. Right now at Clark, there is a thrift store aiming at contributing to sustainability through the proceeds. Other possible businesses through which money can be raised are periodically putting used assets like computers and furniture on market; students giving used books to sell; and public selling of art and crafts by students. University of Pennsylvania encourages students to make arts and crafts with sustainability as a theme, to sell to the general public periodically.

All of these business avenues represent sources of a sustainability fund which can support students to implement manageable projects that result in tangible savings that can be redirected back into the school system, the successful implementation of which depends on the collaboration between various agents of change from the community. Be it the workplace, neighborhood, local community group, or this case an educational institution, every social circle within civil society has a space for individuals to engage others through partnership and collaboration, and thus become "agents of change" that encourage and facilitate positive changes to foster sustainability in their community.

The main challenge with this source of income is having no other colleges in the area that Clark can emulate/learn from. However, if implanted well, Clark will be one of the few schools in the States (and the pioneer in Worcester) that have small business initiatives contributing to the sustainability fund.

General Fundraising

Universities and colleges are non-profit organizations so, like other non-profits, they rely heavily on fundraising to support them. There are two basic kinds of fundraising for most colleges and universities: 1) Individual giving from large donors, and 2) smaller scale donations from alumni (McGadney, 2010). In the case of Clark there are actually a few large individual donors whose donations have a great impact on Clark's capital campaign. The small scale giving that mainly comprises of alumni is more towards education and building connections and does not always involve raising substantial funds (McGadney, 2010).

Individual giving is an essential component of the fundraising efforts. Literature testifies that most often the higher end donations come from single donors and this could be through restricted or unrestricted donations of current or deferred use gifts (Campus In Power, 2010). The design of a fund raising campaign impacts the amount of donations individuals give. So leaders who have a 'narrative' of sustainability well established could attract donors because this could garner interested donors who found sustainability a high leverage option to contribute directly to societal progress (Cummings, 2009). There is a positive relationship between a specific cause and people's intention to donate (Horst et al, 2008). This means that broad goals may not attract much donation but a specific sustainability cause can appeal to donors. Fortunately sustainability is an important funding objective for donors especially those who seek to underscore

environmental values (Cummings, 2009: pg173). This is particularly true with online giving (Bennett and Barksjo, 2005). A recent survey by Target Analytics states that there is high growth rate for online donations and projects that by 2020 online donations will constitute the majority of donations. Research also suggests that 97 percent of people's motivation to donate is derived from the work of the cause and 69 percent is derived from personal connection to the cause (Jacob Nielsen, 2009). Research on other colleges has shown that alumni can be valuable allies in pushing for greener initiatives on university campuses and they are also a potential source of funding for projects (Campus In Power, 2010: pg 35). 'Campus In Power' asserts that offering a sustainability donation option could compel alumni who may not ordinarily donate to consider making a gift (pg 35-36). Potential donors can be strategically targeted based on their fields of study or current profession or class group. Another benefit of fundraising is that when sustainability initiatives are highlighted as causes for giving awareness and education about those initiatives grows significantly.

In many instances, colleges and universities solicit donations from alumni, friends, parents and other individuals for sustainability projects. They effectively do this through the development of clear sustainability goals and activities and specifically ask for donations to support these initiatives (Little et al, 2009). Various sustainability initiatives could be put together and then be tailored to address these specific components as causes for giving. For instance, best sustainability practices could focus on the following areas: academic and research, food, recycling and waste management, water, energy and climate protection, built environment and other incentives projects. Donors are generally motivated to give when there are specific and appealing reasons to give. Therefore outlining clear and persuasive sustainability causes for donation within Clark the general capital campaign has the potential of attracting large sums of donation from individuals, especially alumni. Donors have reasons why they give and are concerned about how donations are used. So presenting clearly stated and specific sustainability goals and projects will allow donors to choose whether they want to invest in short term or capital projects. They may designate their giving to a specific project rather than broad goals (Horst et al, 2008).

Making sustainability a specific fundraising cause at some schools has been successful (Cummings, 2009); Cummings reports that when the University of New Hampshire developed its sustainability as a comprehension program and listed it among possible programs for funding, it raised the interest of a long time major donor to the college who shifted his intention to the new item on the list. This suggests that fundraising specifically for sustainability could be an effective mechanism to fundraise for Clark. At present Clark students are enthusiastic about sustainability initiatives, which is evidence in the participation of incentive projects such as the 'Eco-Rep' hall competition, and above all the interest in sustainability related courses such as Climate Change, Sustainable University and Production and Consumption. Which means in the future the propensity to give by these students could be great. Moreover enormous alumni interest in sustainability has been demonstrated in some other schools, including Cornell, and many alumni are eager to take leadership positions with respect to donating for sustainability

(Gold, 2010). Also there are great examples of alumni involvement and giving in other colleges. For instance, in 2008, an alumni gave 100 dollars to Princeton University to create a center for sustainable energy research, There are Environmental Alumni Association/Network at both the University of Texas, Austin and University of California at Berkeley which do partner with students government to engage alumni and create a green fund for sustainability initiatives(Campus InPower2010).However, the absence of a persuasive avenue to get involved perhaps is the reason for the perception(McGardy,2010) that Clark alumni are uneducated, unaware about sustainability and not enthused to support sustainability causes. So what is needed is the development of a plan to engage alumni in sustainability projects. On this background there is the need for Clark to move towards engaging alumni in its sustainability initiatives and the possibility of alumni sustainability fund because this important for Clark's sustainability advancement.

Phase II: Compatibility Assessment

The second phase of our team project involved talking to various individuals who have critical connections to Clark to gain insight about how the research we had done on funding mechanisms might be appropriate to Clark. During a 4 week period toward the end of the semester we spoke with three individuals who had particularly interesting perspective on the compatibility of the different funding mechanisms that we had researched: (1) Jim Collins, Clark's Chief Financial Officer, (2) Andy McGadney, and (3) Jamie Salo. This section reviews the highlights of what we learned from each of these three individuals.

Jim Collins, CFO Clark University

Our team set up a meeting with in his office. Jim Collins talked about how Clark's financial system was based on a capital budget system. A Capital budgeting system like a revolving loan system as it relies on the savings made by the projects savings over the years and instead of getting returns the amount of money, it is paid through bonds which are long term investments to compensate for the loan taken out from banks in order to complete a project (Dayananda, 2002). This means that as the financial planner looks into the new programs and projects that are going to be implemented the planner has to look over the amount saved and to research how feasible these programs and projects are. "Capital budgeting decisions thus have a long range impact on the firm's performance and they are critical to the firm's success or failure" (Dayananda, 2002). As the main person, in this case Jim Collins has to be making decisions and has to research how successful and how feasible a project is over a period of years. This system may be better than a revolving loan fund in small campuses as the budgeting is easier to concentrate as the fund allocated towards different project is bigger and the savings saved may be used in different campus related improvements. The downside to this is that some areas may lack funding as the bigger projects get most of the attention while smaller short term projects such as sustainability activities can be overlooked. This is because the return for these activities is not guaranteed (Collins, 2010).

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Andy McGadney, VP of University Advancement

Andy McGadney provided our team with valuable perspective on university fundraising. He mentioned how in general there are three categories of donors: (1) the top 10 prospective donors are those who are likely and capable of giving a large sum of money to Clark, (2) the top 100 prospective donors also have potential to give a sizeable financial gift amount to Clark, and (3) then there is all the other potential donors who may give small sums of money that can be allocated to different areas. Andy McGadney also talked about Clark's Capital Campaign as a way to connect and create relationships as well as a method for fundraising. It is important to maintain and foster relationships with the alumni because the closer one feels towards Clark the more likely they may be to contribute towards the success of the university.

Jamie Salo, VP of Strategy and Research at North America Trucost and Sam Covino, President of Covino Environmental Associates, Inc.

These two alumni of Clark talked about what they did after they graduated from Clark. They also shared an interest in sustainability after having a discussion with our class and finding out the meaning of sustainability. Also because of them sharing their thoughts, about sustainability we realized that somehow the alumni need to know about sustainability, the generation gap between the older alumni and the newer alumni showed that information has changed and that overtime more majors' form and the older alumni may not know about them. Hence it is important to keep alumni aware of all changes and to share information about the difference and the projects on the Clark campus.

Results

From our research we discovered some of the barriers and benefits to funding sustainable initiatives at Clark.

Barriers to Sustainability at Clark

Generation Gap

The concept of environmental sustainability, though used frequently today, has only been popular in the United States since the 1970s when international conferences brought the issues to center stage. According to Clark's website, the Environmental Science & Policy Program has only been around since the early 1990s (Clark, 2010). For this reason and from our talks with Andy McGadney we have observed a generation gap between the Alumni donating to Clark and the interests of the students who are meant to benefit from those donations (McGadney 2010). For this reason we propose the incorporation of existing sustainability initiatives into the Alumni Magazine which, according to McGadney, is where the majority of the Alumni learn about campus current events (McGadney 2010). If alumni are alerted of the current interests and activities of students today, their donations will be directed towards funding further and larger scale initiatives that could benefit both the student body and the surrounding community. Additionally, it is necessary to disseminate this information throughout Clark's networks in order

to raise awareness about sustainability on the larger scale – essentially continuing to educate alumni even though they have moved beyond the traditional classrooms.

'Sustainability' Washout

The word 'sustainability' has been used so frequently that it has come to encompass a broad range of contexts, definitions and applications. As a result, it has lost the ability to accurately define projects and initiatives without specific reference to the area of 'sustainability' that is being addressed. This was highlighted in our discussions with Clark alums Jamie Solo and Sam Covino when they expressed that alumni would be more willing to donate to a specific program or project concerning environmental sustainability rather than a general fund (Solo and Covino, 2010). If specific sustainability projects are developed with clear goals, objectives, and outcomes it would make the purpose of a sustainability fund easier to conceptualize and give the donation tangibility – donors physically see how their contribution is making an impact on campus.

Student-Administrative Disconnect

There is disconnection between students' interest in the type of sustainability initiatives and that of the administration. Thus students own interest in sustainability initiatives and the actual actions by administration towards sustainability do diverge from each other. For instance, from our findings there are about 12-14 projects that are either in progress or in the pipeline but students are not in the known. There seems not to be any coordination between interests of students and that of the actions of the administrative body, and even between the students own different sustainability initiatives. The coordination of all these activities will create a visible impact.

University Size

The small size of Clark puts it at a bit of the disadvantage. Many of the colleges that are eventually emerging as green colleges are due to the size of these colleges and the large endowment funds. These enable them to use such endowments, internal campus banks and revolving loan funds to progress in their sustainability initiatives and projects. For instance, WPI and UCR have been able to establish a sustainability fund through a revolving loan fund because of the advantage of a large endowment fund.

Limited Publicity

In addition, limited publicity in what Clark is doing in terms of sustainability stands out a barrier if Clark needs to project itself as one of the giant of sustainability. Sustainability initiatives are not very conspicuous due to lack of advertisement. Websites are good places and usually the first place campus community looks for information but our findings show that Clark website does not cover adequate sustainability and its related information. An institution's public visibility is very important and the website is a good place to start with. So the absent of Clark's specific sustainability initiatives, progress and clear information contrast with many green

colleges where their websites are well enhanced. A well developed Website can serve as the main information portal for all sustainability related activities and events on the campus.

Benefits of Sustainability at Clark

Reduce environmental footprint

Transitioning to renewable energy in most cases makes a campus much more efficient. It may be a large investment to start with, but over time the money saved is greater as well as the reduction of CO₂. As new technologies come out it is best to try and see how effective it is as long as it reduces the current output of CO₂.

Leader in sustainable initiatives

With different sustainability programs on campus it will lead many other universities to look at Clark as an example especially because of the size. What needs to be done to be a leader in sustainability is easy access to information about different sustainability projects, groups and incentives. With being the leader it will attract new students as well as investment. As many universities may not have the initial investment capital to finance full sustainability initiatives, this proposal encourages smaller, manageable changes that can be implemented over time. Therefore, universities like Clark that are interested in innovation and conservation but are not in the financial standing to do so may still take small steps toward sustainability and still reap the benefits of such initiatives. The working hypothesis of this project is that by giving students the ability to systematically decide which innovations/initiatives to enact with the goal of yielding the most profitable results, Clark will have greater fiscal flexibility and the opportunity to redirect their budgetary spending back to their students and education programs.

Attract competitive student body

With having many sustainability projects and activities on campus it will create a student body that is competitive to create different projects that challenge convention and may lead to different sustainability projects. What having a competitive student body comes various ideas that may affect the future of sustainability.

University-wide collaboration

One key aspect that needs to be done is with the knowledge that is obtained through research and various projects should be accessible to different universities. Also with different universities working together more work can be done. Shared knowledge would lead to various new projects in various different areas.

Students and parents can also advocate for a reallocation of the budget for more sustainability initiatives, better resources, and a more productive learning environment. As the Local government can also act as an agent of change by investing in retrofit projects and by providing incentives for educational institutions to consider the benefits of such projects.

Conclusions

Clark's existing mechanism has the structure to support soliciting and accepting donation for sustainability causes. These include but not limited to: a director of the Clark fund; external funding offices; an office of sponsored programs and research; corporate and foundation relations within the university advancement; giving online is one way of raising funds through donation as well as grants from corporate and foundations; alumni, friends and other donors have been active participants; various programs listed for donations. Missing in the list are sustainability initiatives. Yet, there are many sustainability initiatives and these may go unnoticed if these issues are not specifically raised as causes for giving. Clark in its capital campaign and other fundraising mechanisms concentrates on the cause to give through departmental or subject base, fellowship and other challenging causes. However, there is nothing specific about sustainability causes despite its particular need for sustainability advancement. Clark could generate extra and a pool of money through soliciting funds for specific sustainability initiatives. This will also fund sustainability projects and programs that would otherwise go unfunded as well as increasing students, staff and faculty collaboration and participation in finding sustainability solutions for Clark campus.

What do we do now?

Alert alumni to the interests and efforts of current students

As mentioned before different generation of alumni have different understanding of sustainability. What needs to be done is an informative article in the alumni magazine that highlights different new major create over the years as well as different projects on campus. With more information about various new fields alumni would help contribute to various projects as well as investment in different majors other than their major in which they graduated from.

Incorporate sustainability into the Capital Campaign

The Capital Campaign is an important part of Clark in order for Clark to create relationships as well as to improve various aspects of Clark. Also if sustainability was incorporated towards the Capital Campaign it may lead to more donations towards the Capital Campaign. Yet this may lead to various results as mention before some people may not find sustainability a priority in which to investment in.

Work to create a more comprehensive sustainability website

Make Clark's Sustainability Website more comprehensive in order to increase communications between students and administrators interested and involved in campus sustainability. This may include a forum where students and administrators could easily discuss various issues and open up clear lines of communication.

Develop specific projects that donors can fund

In our discussions with alumni Jamie Solo and Sam Covino we learned that donors are more willing to fund specific projects than donate to a general fund. Given this knowledge, Clark should assess its potential for a variety of different sustainable improvements and then advertise to the alumni the potential to fund them.

Future Research

Seek out various green organizations willing to work with Universities on sustainable initiative projects: As mentioned by Jim Collins Clark has different green organizations working to find feasible projects for Clark. So as part of further research more green organizations should be sought in order to try various projects and ideas. Clark should be a center in which different organizations can try and implement trials in order to bring their ideas into a bigger picture. Have developers investigate sustainable projects feasible on small campuses such as Clark: Having different organizations work with Clark's small campus and then spreading the word about how different projects can be achieved in small campus. There may be little funding but it does not mean that big sustainability projects are far from the picture.

Discussion

- Is campus sustainability dependent upon size?
- Do small campuses mean smaller funding? Research on different sustainability incentives in smaller campus instead of big campuses.
- How can students become more involved with sustainable projects at the administrative level?
- As mentioned in the presentation what do students want? As researchers one needs to find out what do students want in order to become more interested in the various projects. A survey of what students want may help sort out the wants and the things that should be worked upon.
- How can we reach out to Alumni and alert them of current student activities?
- Alumni magazine as well as inviting alumni to classes in order for them to learn from what is being talked about in current classes as well as for students to learn about the alumni and what they have done.
- Should we develop a fund to specifically support student-run sustainable activities?

The benefits and barriers towards having a fund specifically to support various sustainable activities vary, but it would be nice to have an institution that can support various ideas as well as educate and inform various groups about what is happening in Clark. Also having one central place where all sustainable practices are happening may help organize different aspects as well as create a much more connected sustainability program in Clark. What needs to be done once a central institution is in place is to create a website that is easy to access and help various groups interact and post different ideas.

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