Greening the University of Michigan Unions: An assessment of best practices and recommendations for the future.

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Executive Summary

The Unions at the University of Michigan are hubs for student activity. They are important buildings on campus, and have the potential to set the pace for a greener, more sustainable campus. The goal of this project is to assess the current sustainability efforts at the University of Michigan Unions and recommend a plan of action to make the Unions greener facilities.

This study examines a number of specific areas of sustainability; energy efficiency, food purchasing, waste (especially food waste) reduction, the use of recycled, biodegradable and reusable materials, recycling, and organization and outreach initiatives at the Michigan Unions. The research for this study includes interviews with operations and administrative Union staff, online investigations of the top sustainability efforts at Universities across the country, and a visual walkthrough audit of sustainability efforts of the Unions.

The University of Michigan Unions have demonstrated success in a number of sustainability initiatives, including a digital, on-line energy-monitoring network, high rates of recycling, pre-consumer composting, use of compact fluorescent lighting, and the "Turn Off the Juice" campaign to reduce energy use. At other institutions, trends in sustainability include more sophisticated energy monitoring practices, purchasing food from local, sustainable and organic sources, pre- and post-consumer composting, standardized and expanded recycling programs as well as high levels of student involvement and outreach on campus. After examining areas in which the Unions' efforts

in sustainability are lacking, and using these best-practices from other institutions as a guide, the study recommends that the Unions, in the short term, standardize recycling bins, increase the density of bins and signage around the recycling areas, increase the amount of biodegradable and reusable products available as well as the amount of pre- and post-consumer composting. In the long term, the Unions should invest in renewable energy, purchase more food from local and sustainable sources, further involve the current sustainability planning and guiding team in operations and appoint a full-time sustainability coordinator for the Unions.

The University of Michigan is a large learning institution fostering a community of intellectual, innovative minds. In order to match and even go beyond the accomplishments of other campuses, the Michigan community, including the Unions, must be creative and innovative in their efforts towards sustainability. If implemented, these efforts will help protect the environment, save the University money in energy costs and ensure the University Union's place as a trendsetter in sustainability practices.

Introduction

The University of Michigan Unions are comprised of three buildings, the Michigan Union, the Michigan League located on Ann Arbor's central campus, and Pierpont Commons, located on north campus. At 500,000 square feet between the three buildings, the unions act as hubs for student amenities and activities including restaurants, food vendors, bookstores, conference rooms, offices, recreation facilities, and students groups. The Unions use roughly 8.5 million kilowatt hours of electricity per year, costing roughly $685,000.

As some of the most heavily trafficked buildings on the University of Michigan's

campus, the University Unions have distinct potential to be leaders in the campus's transformation towards sustainability. While the University as a whole has taken significant strides in the past decade or so to reduce the ecological footprint that this >100,000 person academic community has on its surrounding and global environment, the Unions in many ways seem to have "fallen through the cracks." The project was proposed by the Union Sustainability Team (UST), a group of faculty and staff members at the Unions working to take action toward more sustainable practices within their facilities, to gain more comprehensive research. Working with Jessica Roberts, a University Unions Food Service staff member and a member of the UST, the project team completed a walkthrough visual audit of the three different Union buildings as well as interviews with operations staff to investigate the efforts and shortcomings of the facilities. In understanding that there are certainly areas for improvement, the purpose of this project is to find potential for sustainability in the Unions and offer reasonable means of action. In order to put the Unions' current sustainable efforts in perspective, the study includes a comprehensive benchmarking survey of top sustainable Union facilities in the country. The University of Colorado – Boulder, University of California – Berkeley, Pennsylvania State University, Michigan State University, and the University of Vermont have impressive sustainable efforts within their Union facilities. With the information gathered in all sections of the research, the project team performed a gap-analysis of the University of Michigan unions compared with other universities that have moved further towards sustainability in their unions. The ultimate goal is to compile this analysis into an accessible report and presentation that can be used by the Union Sustainability team to make informed decisions on how to instigate sustainability measures in the Michigan

Union, the Michigan League, and Pierpont Commons.

Present Sustainability Efforts in the University Unions

The first aspect of the Unions that we explored in particular was the recycling program in place at this time. Fortunately, recycling is offered in all three of the locations. In the Union, paper-recycling bins were found next to printers near the computers in both the Tap Room and in the Union Computing Site. Similarly, in the Michigan League, Beanster's Café offers paper-recycling bins near the printers in addition to the glass and plastic bins that for containers sold at the café. In all of the Unions, there are both paper and containers recycling bins available in some capacity in the hallways and many of the commonly used areas of the buildings (Team Audits). In fiscal year 2008, the Unions overall proved to be slightly better than the average campus building in terms of recycling rates. While the Michigan Union, with a rate of 29.5%, fell just below the campus average of 30.6%, the Michigan League recycled at a rate of 35.1% and Pierpont Commons at a rate of 37.8% (In The Loop!). Though these are not the highest rates on campus, they are significantly better than many other buildings. While other buildings may not have as many recycling bins available, the bins may be placed in more highly trafficked areas with clear signs making it easier to recycle, leading to higher recycling rates than the Unions.

Complimentary to the recycling program, there are some efforts towards a more sustainable waste management program at the Unions. One of the larger visible efforts to cut down consumer waste is the sale of reusable coffee mugs at Beanster's Café in the League and at the U-Go's shops in all three of the Unions. Each one of these mugs sold

eliminates the need for many disposable cups, thus cutting down volume of waste leaving the Unions' eateries. The mugs cost $8.00 with a free drink at the time of purchase and saves 25 cents on any hot drink ordered in the mug in the future (Team Audit).

Energy use is another area of the Unions where Operations is working towards sustainability. According to Dave Kautz, the Maintenance Director of the University Unions, there have been a number of measures taken towards minimizing energy usage in the Unions. The buildings are hooked up to a digital, automatic electricity control and are set to maintain themselves at 70-72° F in the winter and between 75-76° F in the summer. This discrepancy allows for less energy usage in both temperature extremes. Furthermore, there are efforts to reduce building patron energy consumption with the "Turn off the Juice" campaign. This includes stickers and other appropriate signage in different visible locations in the building meant to curb unnecessary energy consumption (Interview with Dave Kautz).

Beyond the overall building controls on energy usage in the Unions, there are also measures being taken to limit the need for energy in terms of lighting. Compact fluorescent light bulbs (CFLs) have begun to replace the older, less efficient incandescent light bulbs in different areas of the Unions. In different areas of all of the Unions, CFLs are being used as a quick way to save energy and money. As one example, the Michigan Union Billiards Room has replaced every light over the tables with CFLs. Another important area of lighting sustainability is the use of task lighting. The Michigan Union study room has very accessible task lighting in most areas. The main lobby of the Michigan League also has available task lighting near many of the seats in the room. Finally, one of the best ways to reduce lighting energy is to utilize natural lighting. The

Union facilities have a significant number of windows that allow natural light to infiltrate a room, which saves energy because the lights do not need to be turned on. The Michigan Union has a full wall of natural lighting in the MUG and the Tap Room, and abundant light in the study room, Amer's, the Billiards Room, and many other rooms. Beanster's Café in the League has great potential for natural lighting with an entire sunroom that is only being partially utilized. Overall, the Union facilities show evidence of a conscientious operations staff as well as a good building design for future potential energy reduction (Team Audit).

Best Practices at Other Universities Around the Country

The universities we chose to benchmark, the University of Colorado-Boulder, the University of California-Berkeley, Penn State University, Michigan State University, and the University of Vermont, were selected for a number of reasons. Most importantly, these schools have all demonstrated that they are committed to sustainability at a school-wide scope. While we were unsure of the specific efforts undertaken by each school's union before conducting our benchmarking surveys, we correctly assumed that the schools' overall sustainability efforts would be a good indicator of sustainability efforts in their unions. We also chose these schools for their similar sizes and for the relatively similar climates they share with the University of Michigan.

Energy Best Practices on Other Campuses

Energy use is one the most rewarding places to intervene in any building or facility. Simple changes such as sealing windows, turning off lights and switching to compact florescent bulbs can reduce the environmental as well as the financial costs of powering buildings. Universities around the country have taken the concept of reducing

energy consumption in many different directions, but they all run on the same basic principles. Leaders of sustainability are masters of managing energy use effectively in order to minimize it, rewarding and highlighting the best practices on their campus and continually checking up on building managers and initiatives. What follows is a report of the best practices with regards to energy use management of leading universities around the country.

The University of Vermont has implemented a computerized energy management and lighting control system at their student hub, the Davis Center, a LEED Gold certified building, in order to minimize their energy use. The systems savings has equated to a 52% savings in electricity, heating and cooling (UVM Davis Center). If one only examines the University of Michigan Unions electricity cost, 52% savings would represent roughly $356,000, an estimate that doesn't include heating and cooling savings. All of these monetary savings are pumped back into funding the sustainability efforts at the University, a program called "The Clean Energy Fund." This concept of a revolving sustainability fund is a growing trend on campuses. The Buff Energy Star Program at the University of Colorado - Boulder engages and challenges building proctors to reduce energy waste and improve efficiency. The campus Resource Conservation Office & Facilities staff runs the program and ensures the best practices on campus are showcased, recognized and rewarded (Resource Conservation). CU-Boulder also recently launched the Nightly Campus Conservation Tour, which is responsible for patrolling randomly chosen buildings looking for energy conservation best practices currently in use as well as investigating further conservation opportunities. They examine the heating and cooling practices and report issues, turn off unused lights and computers, and leave instructions

for how to manage power on desktop computers. These and other measures at Boulder have save a large amount of money where between Fiscal Year 2004 and Fiscal Year 2005, there was a 5.62% decrease in energy usage per square foot on campus resulting in a savings of $962,502 (Campus Resource Conservation Program, 2006). Through similar initiatives focused on HVAC (heating, ventilating and air conditioning), lighting and computing practices Michigan State University has aimed to reduce electrical energy use by 9% in each building on campus. MSU is also working on decreasing the hours of operation for less used computer labs and study areas as well as utilizing hibernation settings on computers (Boldness by Design). Pennsylvania State University has taken a slightly different route towards reducing its energy usage by hiring an outside company, Energy Savings Company or ESCO to manage the retrofit of campus buildings. (Penn State's Energy Saving Initiatives). These exemplary schools have demonstrated that significant reductions in energy use at their unions can be achieved through efforts that often require little time or money, and that these reductions can result in savings of tens if not hundreds of thousands of dollars in addition to protecting the environment.

Food Purchasing Best Practice on Other Campuses

There is a growing trend within the global environmental movement to "Eat Local" and support the local sustainable agricultural systems of this country, especially in a time of economic depression. Locally and organically grown fruits, vegetables and grains as well as dairy products and farm-raised meats have a smaller impact on the environment. The University of Michigan Union building has many dining options and eateries that have made a very minimal effort to serve sustainable food options. Instead most of the food comes from large industrial food vendors and distributors, such as

Wendy's and Sysco (Team Audit).

By utilizing sustainable food purchasing practices, which can include buying organic, local and sustainably grown food, unions can reduce the environmental impact of growing food as well as lower the costs of food transportation if a school buys locally. The University of Vermont is a leader not only in local food procurement and use, but also in its outreach and education. The introduction of the "Growing Vermont" program serves as an example of their commitment to all aspects of sustainability. The educational and entrepreneurial student run program and store is located in the University Union (The Davis Center). In addition to offering a wide selection of locally produced products, "Growing Vermont" also shares information on the importance of buying local (UVM Grow Vermont). The Michigan State University student organic farm uses solar green houses, cold storage and hoop houses and is the first year round community supported agriculture (CSA) in the state of Michigan. Programs to use the food produced in these green houses in the University Dining Halls are in the early stages of implementation (Student Organic Farm). The University of California at Berkeley has made a commitment to sourcing local and organic food when possible by making an alliance with "Buy Fresh Buy Local" to purchase locally at least 10% of all food purchases and strive for 25% local purchasing. Penn State also hopes to reach 10% local purchasing through its farm to college program. The program has its own full-time coordinator responsible for nurturing and maintaining business ties between local farms and the University. The program currently brings in 100,000 pounds of cheese, mushrooms and ice cream to the dining halls from the University farm as well as 70% of the milk consumed (PSU Green Destiny's Ecological Mission for Penn State). Universities also

have a responsibility to engage in ethical purchasing. While food purchasing does not present the same money-saving prospects as an effort like energy conservation, it does present university unions with an opportunity to invest in their local economies by purchasing locally grown and produced food items.

Food Waste Best Practices on Other College Campuses

Intercepting food on its way to the landfill is another extremely important concept in sustainability. Composting, which turns food waste into decomposed fertilizer, can minimize the creation of waste and turn it into something useable. Composting can occur with waste generated by preparing food (pre-consumer composting) or with excess waste after food has been eaten (post-consumer composting). The University of Vermont union has implemented a comprehensive composting program in which food scraps and coffee grounds are collected each day and are taken to an outside contracted composting facility called Intervale. Here they are used to produce Intervale Compost, which is sold to farms and gardens in the area and also used for campus grounds keeping (UVM Sustainability). The University of Vermont student center, The Davis Center has built-in compost collection spaces as well as extensive signage educating and encouraging students to sort their food scrapes (UVM Davis Center). Similar student efforts at Colorado Boulder combined with the "Let's Get Down to Earth" campaign to educate all dining staff on green cleaners, recycling, compositing, and organic/natural food have resulted in over 100 tons of pre- and post-consumer food collection which shipped to a private facility in Golden, CO (Greening of State Government Executive Order, 2008). At Berkley all waste produce by dinning services is organic and is composted. Berkeley has also started the Berkeley Worms project, a pre-consumer waste effort that collects food scrapes and

uses vermicomposting (composting by worms) to turn waste into useable soil sold at local farmers markets, plant nurseries, and in the bulk landscaping market (Campus Sustainability Assessment, 2008). A study at Michigan State University estimated that cafeterias on campus collectively generate about 14,000 pounds of food waste each day (MSU: Wasted Students? Or Wasted Food?). If all of this food waste were composted, the University could greatly reduce the cost of purchasing fertilizers for landscaping or could sell the compost generated to local farms or landscaping companies. In summary, composting represents an opportunity for university unions to turn a waste product into a valuable commodity, and eliminates the amount of waste that is unnecessarily sent to landfills.

Recycling Efforts and Use of Biodegradable/Nontoxic Products on Other Campuses

Where the University of Vermont, University of Colorado at Bolder, Michigan State University, University of California at Berkley, and Penn State University are making some of their greatest sustainability efforts are in their recycling programs. Vermont is able to collect and recycle a wide array of materials including: glass, steel, any metal or tin cans, aluminum cans, foil, pie plates, all numbers of plastic bottles and jugs, plastic dairy tubs, clear plastic hinged take-out containers, hard plastic frozen-food trays, plastic flower pots, and plastic lids larger than two inches in diameter (UVM Sustainability). At Michigan State, their Environmental Stewardship Recommendations states that all plastics will be collected together and any other materials will be collected together, excluding white paper. The idea behind this is to standardize the recycling setup in each building to increase the amount of recycling that is done (Boldness by Design). Then within their student union, Michigan State offers recycling for white

paper, colored paper, newspaper, cardboard, plastic, light bulbs, electrical ballasts, batteries, electronics, ink/toner cartridges and most anything that is not trash (Interview with Doug Murdoch). Berkeley also has a similar program in their campus buildings. All buildings on Berkeley's campus have the opportunity to recycle mixed paper, including cardboard, at their desk side. Custodial services later collects the mixed paper along with refuse, and delivers it to a service area (Campus Sustainability Assessment, 2008). In a major effort to reduce the amount of un-recyclable paper on campus, CU-Boulder is prohibiting the posting of deep-dyed "astrobright" paper, which cannot be recycled due to the chemicals in the paper (Greening of State Government Executive Order). Penn State also has many opportunities on campus to recycle. Both fluorescent tubes and batteries, two items that are usually difficult to recycle, can be collected on campus. They are then taken to a recycling center where the fluorescent tubes are used to manufacture new lights tubes and the car batteries are recycled through a local garage (PSU Recycling).

These schools have also been making efforts to integrate biodegradable products and up their recycling efforts on campus, the unions in particular. At Vermont, their Dining Hall Service uses biodegradable products in place of utensils. These include Green Mountain Coffee cups, Greenware paper plates, parfait cups, and other items as requested. They also solely use brown recycled napkins and grill liner papers (UVM Davis Center). Berkeley is making efforts similar to Vermont, as they are using to-go containers made from sugar bagasse by Excellent Packaging & Supply. Boulder also recently began using EcoLab to provide more environmentally friendly packaging for dining operations (Greening of State Government Executive Order).

Schools are also making efforts to use environmentally friendly cleaning products. Vermont uses green cleaners like EnvirOx, The Greasinator, and Mineral Schock (UVM Davis Center). Michigan State strives to make sure all their cleaning products comply with environmental standards; their union uses a polishing and maintenance method on their terrazzo, a faux marble, which eliminates the use of wax and strippers (Interview with Doug Murdoch). While the other schools did not provide specific names of their cleaning green cleaning products, all the schools noted that they are conscious of the effect of non-green cleaners on the environment are attempting to improve the amount of green cleaners they use.

Organization & Outreach Best Practices

In order to fully integrate sustainability at many of these universities' unions, there have been organizational structural adjustments made to better enable this integration. The University Memorial Center (UMC) student union at CU-Boulder is a representative from the Environmental Center as an Ex-Officio board member (University Memorial Cente, 2009). This gives the Environmental Center and sustainability a voice in union decisions. Michigan State has a different set-up, where there is a four-person sustainability team in the union (Interview with Doug Murdoch). Each member of the team is assigned to addressing one quarter of the union to take responsibility for and to be held accountable for the sustainable practices in that section of the union. Finally, a number of schools employ a sustainability fund where the monetary savings that occur from different sustainability projects is returned to the fund in order to help establish further projects in the future.

Campus outreach has also been important in bringing sustainability into the

community of students, faculty, and staff. CU-Boulder exerts a lot of effort in raising awareness about recycling through programs like the recycling bulletin, recycling displays in campus buildings, and in-office presentations on recycling (Education & Outreach). In order to engage students, faculty, and staff in the process of sustainability, Berkley has Sustainability Pledges. These Pledges make individuals in the university community more active in the process of enacting sustainable measures on campus. Finally, Penn State makes campus education such a focus, promoting ecological literacy is one of only eight aspects of the university's sustainability program. Since a building is only as sustainable as its occupants, an effective education/outreach program is vital to integration of sustainability into the framework by which the university functions.

Gap Analysis

After looking at the best practices of Universities across the county, we are able to return to the Michigan Unions to take a closer look at the areas that need the most improvement. Visual audits of the Michigan League, Pierpont Commons, and the Michigan Union were conducted to assess the successes and shortcomings of the facilities from a sustainable perspective. A summary of these successes and shortcomings in the areas of Recycling, Waste, Energy and Food Purchasing is listed in the charts indexed below.

Recycling

We looked specifically at the accessibility, visibility, arrangement and number of bins available for recycling. Overall, we feel that there can be more bins that should be placed in areas where there high traffic flow. This would place the bins closer to the consumer and as a result, it would be easier for them to recycle. Good recycling practices

are demonstrated at Beanster's, where there are glass, plastic and paper recycling receptacles alongside the trash bins. However in the lobby of the League, the recycling bins are located towards the back of the hall, far away from the nearest exit from Beanster's. Also in the MUG, another high-traffic dining area, the recycling bins are tucked away in dark corners, making them difficult to seek out. Our specific recommendations for improving recycling in the Unions include increasing the number of bins in all hallways and rooms, so that each has a full set. It would also be beneficial for these bins located nearest to the exit. For every trash bin, there should be a set of recycling bins with visible signage. Lastly, bins should be standardized in color and signage in order to improve recognition, making the task of recycling easier for consumers.

One way to make recycling of unusual objects, not accepted in the standard bins, more convenient for University residents, is to have the Michigan Union act as a "Recycling Hub", similar to the practice at Michigan State University union. We recommend this for the Michigan Union because it is the most recognized and central student union on Michigan's campus. A good location for the recycling center would be in the far left corner of the basement by the Barnes & Noble Bookstore. If placed in this location, the Union would have to do little rearranging to incorporate the recycling center. There, students would be able to recycle batteries, lightbulbs, printing supplies, and other 'unconventionals.'

Waste

At the best sustainable Universities in the country, Zero Waste initiatives are being enacted. This high goal is far from the current state of University Unions waste

program. The food vendors in the Unions do not offer reusable "for here" mugs for hot drinks or glasses for cold drinks, nor do they have reusable condiment dispensers. There is excessive wrapping on products, including utensils, baked goods, and condiments. The few sustainable materials used, such as water-based garbage bags and biodegradable to-go cups, can only be found at a select number of vendors. Although there is a composting program at the University Unions, it is limited to pre-consumer waste collected in one dining facility, the University Club. This means there are no composting programs for any of the other Union run eateries nor for the private vendors in the facility. Overall, efforts toward waste reduction are minimal.

We suggest all food vendors in the Union be required to provide reusable and/or biodegradable utensils, cups, plates, etc. In cases of private vendors, whose health codes might not allow for reusable materials, the Union facilities should provide them. These changes should be outlined in the contracts the vendors sign and vendors unwilling to cooperate should not be allowed. To improve the composting program, the type of compost collected should be expanded to include both pre- and post-consumer waste from union dining facility as well as private vendors. Post-consumer waste should be collected around the waste and recycling bins in common eating areas with proper signage and instructions to ease the process. Education programs will be necessary for consumers and staff to ensure composting happens properly. If the Materials Recycling Facilities in Ann Arbor cannot support the amount of compost that would be produced by this increase, the Unions should establish relations with a local farm that can collect the compost. The Ross School of Business is in the process of establishing a relationship with a local farm. Collaboration with this project is encouraged.There are numerous

benefits of composting including reduced waste which translates to savings in landfilling costs as well as eliminating the need to buy soil for landscaping and grounds maintenance. Compost can also serve as an additional form of income as it is a quality (natural) fertilizer and can be sold.

Energy

Energy consumption, most observable in heating and lighting, is another area we covered in our audit of the Unions. On a positive note, we were pleased to find out that the Union has an online energy monitoring system that can track energy use and heating in specific parts of the building and that the CFL's are beginning to replace incandescent bulbs in many sockets. There are still are number of areas pertaining to energy use in the Unions that need improvement. Many lights, computer monitors, printers and other energy users are left on unnecessarily. Additionally, while there is natural light available in the Unions, much of it is underutilized. For example, in the atrium of Beanster's shades cover all overhead windows and lights are left on even when there is enough natural light filling the room. Although thermostats in March were set at reasonable temperatures, around 70 degrees, many locations in the Union felt uncomfortably warm. Many windows in the Unions are single pane, providing poor insulation and allowing cold drafts into the building. However, it must be taken into account that a majority of the single paned windows in the Michigan Union are historical stained glass. Further research should done to see if it is possible to preserve the stained glass windows while adding more insulation to them.

We recommend that at least one Union staff member be monitoring the temperature in the Union facilities at all times to prevent excessive heating or cooling and

lowering and raising the temperature accordingly in unused parts of the buildings. All maintenance staff could share this responsibility by taking shifts throughout the week using the existing energy-monitoring system. An operations staff member should also conduct weekly assessments to report trends and help set goals in energy reduction. All incandescent light bulbs should be replaced with compact fluorescent bulbs and custodians should be instructed to turn off lights in rooms in the Unions that are not being used. Where economically feasible, timers and motion sensors should be installed to automate light usage. Any available natural light should also be utilized to reduce lighting costs. Computers in Union computing sites should be set to energy efficient settings, ensuring that no excess energy is wasted when computers are not in use. Greater efforts should also be made to post above light switches the already-printed stickers that encourage building users to turn off lights on their own. As a long-term goal, an effort should be made to establish a relationship with a renewable energy provider or to create a means to produce its own renewable energy, such as installing solar panels. All of these efforts, in addition to reducing energy waste, will save the Union large amounts of money in energy costs. The Unions have calculated that even a 3% reduction in energy use between the three buildings would save roughly $20,000 per year.

Food Purchasing

Through research and interviews, we found a need for improvement in sustainability in a number of other areas in the Unions, not directly visible in the audits. For example, a growing trend in the sustainability movement is supporting local agricultural systems. Local, seasonal foods have a smaller carbon footprint and are usually fresher and healthier than food coming from large industrial agribusinesses.

Despite these benefits, the University Unions have made little effort to invest in local food systems. Ann Arbor and surrounding areas provide a superb resource for fresh, local produce. Following the lead of Housing Dining Services, encouraged by the student group Michigan Sustainable Foods Initiative, Union dining services should start incorporating seasonal produce into their menus as a short-term goal. As a long-term goal, Unions dining facilities should establish relationships with local farms, working with them to shift away from using carbon intensive food suppliers towards sustainable agriculture.

Organization and Outreach

In order to integrate sustainability into the unions, there are a number of short and long-term recommendations that the background research would suggest to be effective. For organization, the current Unions Sustainability Team [UST] should be given more of a say in operations and facilities management. They are the best versed in sustainability and if the unions are to begin the transition in that direction, the UST is a valuable resource to be used. Furthermore, it would be relatively easy to have a sustainability representative on the Michigan Unions Board of Representatives [MUBR]. CU-Boulder's Environmental Center Board Member has shown that just this voice in the decision-making process can lead to significant changes in organizational mindset. The longer-term recommendation that would most benefit the Unions would be to have a sustainability point person (or persons) to be responsible for making sustainability in the Unions a consistent priority. This position could either be filled by a paid employee of the Unions or by a student intern or group of student interns who would be able to devote a substantial amount of time to researching what can be improved and working on

projects that address sustainability issues in the Unions.

For outreach, there are similarly short and long-term goals to be addressed. One of the easier measures to be taken is to increase signage around the Unions to promote education and awareness in the general student body and all occupants and visitors of the University Unions. There are a number of places where simple signs could help building users to understand why it matters to be more sustainable and simple ways they can go about doing it. One example is to post a sign in the Michigan Underground next to the paper recycling bin near the Pizza Hut Express letting diners know that the pizza boxes are recyclable in Ann Arbor. This and many other opportunities exist to raise awareness with a mere 8.5x11 sheet of paper. In the long term however, a comprehensive education plan should be enacted to teach all users of the Unions what sustainable practices are already being performed and general information about the ecological and social benefits of being more sustainable. The Unions can draw from the example of the TIES program in the Samuel T. Dana Building on Central Campus to create a more educated building population.

Summary of Recommendations:

The study proposes a comprehensive list of short term and long-term goals for the University Unions in the areas of Recycling, Waste, Energy, Food Purchasing and Organization/Outreach.

Recycling

Short-term recommendations:
- Increase bin frequency in the hallways
- Standardize recycling bins

Long-term recommendations:
- Make the Michigan Union a recycling hub for unconventional materials
- Increase education on recyclables/non-recyclables

Waste

Short-term recommendations:
Provide reusable or biodegradable mugs/cups/plates/silverware
Replace plastic wrapped items with reusable dispensers (i.e. condiments, salt, pepper)
Long-term recommendation:
Develop and expand to pre- and post-consumer composting (with a local purchaser)

Energy

Short-term recommendations:
Utilize natural light
Set computer monitors to energy efficient settings
Increase signage around light switches
Long-term recommendation:
Establish a relationship with renewable energy provider

Food Purchasing

Short-term recommendation:
Implement seasonal menus at all Union eateries
Long-term recommendations:
Establish working relationships and contracts with local farmers
Work alongside Dining Hall efforts with the Michigan Sustainable Foods Initiative

Organization/Outreach

Short-term recommendations:
Give UST larger voice in operations/facilities management
Increase signage for education/awareness to encourage behavior change
Create a sustainability position in Michigan Union Board of Representatives
Long-term recommendations:
Create position of Sustainability Point Person (paid or student interns)
Create an education program to showcase the greening of the Unions

Challenges

While we believe that all of our suggestions are feasible given the necessary focus and effort, we also recognize the inherent challenges in achieving these recommendations. One of the largest challenges in improving the sustainability of the Unions is the buildings themselves. Both the Michigan Union and the Michigan League were built in the first half of the 20th century, when the concept of sustainability was

years from existence in building construction. For this reason, the buildings have a number of energy-inefficient design features: large, elegant single-pane windows, many unnecessary lights, inefficient heating and cooling, and many large, seldom-used rooms. It becomes difficult to manage energy practices when the buildings themselves are so inefficient in many ways. Moving from a physical to an organization and institutional standpoint, as is the case with any large organization, organizational inertia can make changing sustainability practices difficult. A commitment to sustainability requires involvement from every level of organization, from the top to the bottom, which can be a difficult mindset to implement. Organization in the Unions is also decentralized, so decision can require jumping though many bureaucratic hoops. The Unions are separated from the University's general fund, which means obtaining funds to make physical changes or hire a sustainability coordinator could be difficult. Lastly, many of the largest users of energy and generators of waste in the Unions are independent vendors whose practices must fall within the boundaries of corporate rules. In the case of independent vendors, implementing programs like pre- and post-consumer composting or requiring vendors to provide renewable dish ware and utensils can be difficult. We recognize these challenges not to provide an outlet for those opposed to implementing sustainability initiatives in the Unions, or to say that sustainability initiatives are impossible in the Unions, but instead to take a realistic view of what can be done to improve sustainability and what will be more of a challenge.

Conclusion

The University Unions have taken strides toward operating on a more sustainable model. They have invested in energy management systems, made an effort to proliferate

recycling and worked to limit waste production by encouraging the use of reusable mugs. The recent inception of the University Unions Sustainability Team illustrates University Unions dedication to creating a more sustainable atmosphere in its facilities. However, the efforts of the University of Michigan pale in comparison to the efforts made by other institutions around the country (namely University of Colorado at Boulder, University of Vermont, Michigan State University, University of California at Berkeley and Pennsylvania State University). These schools are on the cutting edge of sustainability and we should strive to model them here in the University Unions. Integrating comprehensive energy management programs with conservation efforts in climate control and lighting will lead to energy savings that can be reinvested into future greening efforts to help solve the funding issues. Bringing locally and organically produced foods into the Unions will not only allow the unions to serve fresher, healthier foods, it will also help support local industry and agriculture. Reducing waste is possible by using reusable products where possible and recyclable, ultimately limiting the amount of refuse sent to costly landfills. Composting programs can further reduce the outflow of waste and benefit the university by providing organic fertilizers for grounds work. Increasing the voice and power of the Unions Sustainability team in combination with creating a Unions Sustainability Intern or team of Interns can help streamline and facilitate these efforts. To act as an effective sustainability hub the University Union facilities must make a commitment and concerted effort not only towards greening their practices but also towards educating the students, faculty, staff and visitors of these sustainable practices. And finally, the efforts should not be limited by those recognized as "good practices" on other campuses. The University of Michigan Unions are a unique entity, and innovation

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	Michigan Union, Michigan League, Pierpont Commons

alongside the commitment to shift towards closed loop, sustainable practices will be vital in order to create change within these facilities.

Topic	Comments/Observations
Recycling:	
Accessibility	Tap Room: Near printers (only paper) MUG: 1 paper near garbage, few receptacles in back of main seating area, one paper/container in main atrium, the rest not near anything (none near newspaper stand) Computing Site (CS): Decent for paper, none for containers Study Room (SR): None in room, some just outside doors Main Floor (MF): Outdated/small recycling bins, poor placement 2nd & 3rd floors (2&3): no recycling bins in hallways League hallway: no bins in south half of the hallway
Visibility	Tap Room: Hardly visible MUG: Difficult to find even when looking for them, three bins directly in front of MUTO CS: Very visible blue for paper SR: Blend into wall, barely visible at all Billiards Room (BR): Big bins with large "Please Recycle" signage MF: Outdated and small, tucked into corners, hard to see League Underground: recycling bins together in dark corner
Arrangement	MUG: Tucked away in dark corner, back in main eating area CS: Near printers/copy machine, at the end of computer tables SR: Not near where paper is being discarded BR: Near vending machines MF: Tucked in corners League hallway: no paper bins near Daily stands Beanster's: paper recycling next to printers
# of Bins	Tap Room: 1 paper MUG: 1 containers, 2 paper CS: 3 paper SR: 1 paper, 1 containers MF: 1 paper, 1 container 2&3: none
Other Recycling	Beanster's: slot for containers bin did not fit all containers sold
Waste:	
Biodegradable	MUG: Freshëns has 100% compostable/reusable cups Beanster's: water-based biodegradable trash bags
Composting	Beanster's: pre-consumer composting
R. Condiments	MUG: Individual condiment packets Beanster's: bottled lemon, honey and sugar
Dishware	MUG: Individually wrapped/plastic straws/utensils
Containers	MUG: Much (non-degradable) packaging Beanster's: No "for here" cups, mugs
Energy:	
x 2 paned window	Union: Mostly single-paned stained glass Pierpont: mostly 2 paned glass

Thermostat Placement Avg Temp	Found one of the third floor – set for 70 degrees, large radiators placed in front of open windows Pierpont: customer controllable thermostat Beanster's: set to 70 degrees in February Unions felt uncomfortably hot (even in the winter)
Bathrooms	League: auto sinks and soap, 1 waterless urinal Pierpont: auto sinks and toilets
Computing	Beansters: 7 monitors left sleeping (on) all day Campus Computing site: 11 monitors, 2 printers, 1 copier, 2 big screens left on/sleeping all day
Lighting:	
Compact Fluorescents	Tap Room: None MUG: None BR: pool table overhead lights compact fluorescents, rest of overhead lights were incandescent Entire Union: Sporadic, looks like being replaced as incandescent burn out MF: Half compact fluorescents, half incandescent in overhead lights
Lights/comp on	Tap Room: 10 computers (all on while some unoccupied) MUG: 12 computers and 1 tv (all on) CS: Most unoccupied computers on sleep mode (not off) 2&3: Better effort to turn off unused lights
Unnecessary Lighting	MUG: Upper eating area during daylight Tap Room: unnecessary lighting for blank spaces of wall SR: Most because of accessibility of natural & task lighting
Task Lighting	SR: Lots of available (most left on even when not in use) Beanster's: task lamps without self-adjustment used alongside overhead lights left on all day
Use of natural light	MUG: In upper eating area SR: Many windows around two walls of room 2&3: In hallways Beanster's: sunroom lighting dampened by shades
Food	
Vendors/options	League Underground: Wendy's, Taco Bell Beanster's: transitioning to a local/seasonal menu Pierpont: Quizno's, Panda Express, Pizza

Works Cited

CU Campus Resource Conservation

Program http://www.colorado.edu/facilitiesmanagement/about/conservation/documents/ConservationProgressReport05_06.pdf
CU Education &
Outreach http://recycling.colorado.edu/education_and_outreach/index.html
CU Greening of State Government Executive
Order http://www.colorado.edu/facilitiesmanagement/about/conservation/documents/GreeningofState-CUReport.pdf
CU Resource Conservation
http://www.colorado.edu/facilitiesmanagement/about/conservation/energystar.html
CU University Memorial Center http://umc.colorado.edu/
UVM Davis
Center http://www.uvm.edu/~davis/?Page=environmental.html&SM=enviromenu.html
UVM Grow Vermont http://www.uvm.edu/~growvt/home/
UVM Sustainability http://www.uvm.edu/~sstnblty/
Boldness by Design: Strategic Positioning of Michigan State University. Michigan State University. <http://boldnessbydesign.msu.edu/default.asp >.
"Interview with Dave Kautz." Personal interview. 9 Mar. 2009. uhbuhb
"Interview with Doug Murdoch." E-mail interview. Mar. 2009.
Student Organic Farm. Michigan State University.
http://www.msuorganicfarm.org/home.php/
"But Fresh Buy Local": http://www.greenbiz.ca.gov
PSU College to Farm: http://susag.cas.psu.edu/
PSU Green Destiny's Penn State Indicators Report : pdf at
http://www.bio.psu.edu/Greendestiny/steps.shtml
PSU Green Destiny's Ecological Mission for Penn State: pdf at
http://www.bio.psu.edu/Greendestiny/steps.shtml
PSU Recycling: http://www.opp.psu.edu/environment/recycle/index.cfm
PSU Energy Saving Initiative: http://live.psu.edu/story/7650

Works Referenced

Excellent Packaging and Supply: http://www.excellentpackaging.com/pages/1/index.htm
UofM TIES program :http://www.snre.umich.edu/ties
PSU Sustainability Council: http://www.smeal.psu.edu/news/latest-news/february-2009/faculty-research-center-directors-form-smeal-sustainability-council
PSU Sustainable Education: http://www.schreyerinstitute.psu.edu/Sustainability/
PSU Green Destiny's Finance and Business Strategy for Environmental Stewardship: pdf at http://www.bio.psu.edu/Greendestiny/steps.shtml .
PSU Green Destiny Council: http://www.bio.psu.edu/Greendestiny/index.shtml
PSU Center for Sustainability: http://www.cfs.psu.edu/
PSU College to Farm: http://susag.cas.psu.edu/
PSU Green Destiny's Penn State Indicators Report : pdf at
http://www.bio.psu.edu/Greendestiny/steps.shtml