Sustainability Studio
Presents:

The Power of Purchase

A report developed by the ENVIR 480 class
Winter 2016
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Introduction

The old adage, “You put your money where your mouth is” applied widely to our class focus this term – green purchasing. Acknowledging where the University of Washington collectively puts its greenbacks, however, was just the beginning of our research. This term, we looked into the why of how we make our purchases, looking at different methods and models to assess consumer behavior – including our own. We learned the basics of traditional cost-benefit analyses, as well as how this model can be updated to include a wider array of the costs and benefits that Environmental Studies courses continue to promote. We looked into how co-ops are formed, and developed our own shared resources network.

Along the way, we heard from experts who spend their days assessing their own company’s purchasing – we were lucky enough to have guest lecturers from both Starbucks and Joint Base Lewis McChord, and we all enjoyed a field trip to Watson Furniture, where we got to see first-hand how different purchasing agreements and resource streams structured the very fibers of every chair, desk and piece of office equipment the sustainable business creates.

As with every term, the Winter 2016 class’ central learning component came from the in-depth group projects that were developed around the needs of our client partners. Client partners for this term included multiple branches of Housing and Food Services, the Office of Sustainability, the Purchasing Office, and UW Environmental Health and Safety. The Winter 2016 class was split into seven different groups that worked on projects that:

- Analyzed student consumer behaviors in the dorms
- Assessed UW’s current corporate social responsibility protocols (and how we compare to other schools in the Pac 12)
- Developed a cost-benefit analysis for waste reduction technology on North campus
- Designed and implemented a pilot survey on communication and relationships between for UW labs and Environmental Health and Safety
- Did an overarching assessment of current green purchasing and business diversity at UW
- Examined the sustainability and consumer preferences of several printing paper manufacturers
- Analyzed the overall footprint of compostable vs. reusable to-go food containers

Each team’s original research and results is included in the chapters that follow. We hope you enjoy our research.
Green Purchasing and Business Diversity

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Objectives and Background

Our project for this term’s Sustainability Studio was to provide a report on how much the University of Washington departments spend on green products, which are defined as products with reduced impact on human health and the environment (when compared with competing products that serve the same purpose). Our personal criteria for what a green product should include are that:

- It is made of recycled content
- Is biodegradable or compostable
- Doesn’t need many chemicals to make or produce, and
- Is certified by a third party environmental group or has an ecolabel.

We also looked at how UW is supporting business diversity, which includes any local, women-, or minority-owned businesses. Another facet of our research included an educational outreach campaign on how to better educate and encourage students to purchase green products around campus. We created a survey to gain understanding of student’s attitudes regarding green purchasing and, based around our findings, made a poster portraying what green products are offered around campus and where students can buy them.

We worked with two client partners: Sean Schmidt of the UW Sustainability Office and Claudia Christensen, the Procurement Manager for Procurement Services. They were very open to introducing us to further connections and resources to help with our project, including Angela Battle, the Director of the University of Washington’s Business Diversity Program (BDP). She talked to us about how she promotes BDP businesses to different departments and the challenges behind these decisions. Claudia also introduced us to the UW Safety, Sustainability, and Preparedness Expo where we met Cindy Tsuei. Tsuei is the Vertical Market Manager of Office Depot. Due to the company being one which the university annually spends millions of dollars, we made these purchasing decisions a main focus of this project.
Office Depot

Office Depot is company very conscious of green purchasing. In the 2014-2015 fiscal year, the University of Washington spent $4,015,153 with the company. Thirty-four percent ($1,380,153) was spent on recycled, remanufactured and other green products, while $2,635,237 was spent on “non-green” products. In Office Depot’s procurement services, one way that they encourage buyers to purchase green products is by suggesting greener alternatives to the products one places in their online cart. For example, if an individual were to purchase copy paper online, a pop-up would appear offering copy paper made with 50% recycled content. These pop-ups would continue until the buyer either closed out of the pop-up or chose 100%. We found this to be a great method to push others to buy green because they would have to be actively choosing to buy a less environmentally friendly option. Office Depot also has different levels corresponding to how eco-friendly a product is, with levels ranging from yellow (non-green) to light, medium and dark green (most green). We specifically looked at Boise Aspen 100 Multi Use Recycled Copy Paper. This product is considered dark green because it follows the environmentally-friendly criteria - it is made with 100% recycled content, processed chlorine-free, and has various third party certifications such as the Forest Stewardship Council Certification, LEED Credit, and EPA Comprehensive Procurement Guidelines.

UW and Business Diversity

The UW Business Diversity Program works to connect diverse businesses with contracts and procurement at all three campuses. They encourage the UW community to expand its commitment to inclusion and equity while providing opportunities for local, women- and/or minority-owned businesses. The Statement of Business Equity Policy No. 16 “reinforces the values of inclusion, equity and justice at the UW,” making it clear that business practices will be guided by inclusiveness and equity. The policy ensures the UW will actively engage with the diverse business community to provide opportunity.

and support the broader economy of Washington State\textsuperscript{3}. Currently, there are 259 UW purchasing contracts, and 105 of these contracts are with diverse businesses. The total diversity spend at the University of Washington is $137,953,181.49, which is 9.89% of the university’s total spend.

**UW Departments**

We wanted to gain a better understanding on how individual departments across campus handle their purchasing needs and to see whether or not they consider sustainability or business diversity when making their purchases. Our goal was to get input from a variety of departments by looking into different fields of study that we all had a personal connection with. We planned on speaking with the French, Environment Studies, and the Dance departments, but unfortunately were only able to get information from the Dance department. We learned that although they have relatively minimal spending needs, the department mainly uses eProcurement and Shared Services for the things they do buy. While we weren’t able to get in contact with Shared Services to see how adamant they are on buying green, we learned that they handle most of the purchasing for the smaller departments throughout the Arts & Sciences. According to the Dance director, Kelly Canaday, sustainability and supporting business diversity are not considered when handling any purchases not made through a third-party service. Her reasoning behind this was that it isn’t feasible because of a lack in convenient or readily accessible lists - so we believe, moving forward, giving each department access to a comprehensive list depicting which products are sustainable and which companies support business diversity is important for encouraging them to become more interested in green purchasing.

**Our Survey**

After receiving valuable information from faculty and their departments, we decided it would also be beneficial to get the inputs and opinions of students in regards to green purchasing. We used a survey in order to find out if students know what green

\textsuperscript{3} University of Washington Business Diversity Program Highlights. 2015.
purchasing is, if they buy sustainable products, or if they’d be interested in expanding their options for buying more sustainable products on campus. We posted our survey to four different Facebook groups and received a total of 37 responses from students on the UW Class of 2017 page, Environmental Studies Majors, UW Earth Club, and in various UW sorority and fraternity members. Our survey consisted of five questions:
We concluded that students know and understand what green products are, and while they try to buy them when they are available, students tend to just buy what is convenient instead. Students agreed that they would be interested in the UW expanding their green product market, but would be most encouraged to buy sustainably if there was better pricing and more availability. We hope these survey conclusions will help encourage the UW to change the way they sell and advertise for sustainable products so that students will become more interested in buying green.

How Can Students Get Involved?

Because of a lack of availability and information for students at the University of Washington, we came up with a plan to help educate students on green purchasing and to promote these products to them. Each of us looked at a different building on campus to examine what products were available for students to purchase. We examined three major campus hubs: Suzzallo Library, Odegaard Library, and the District Market. We were surprised to find a lack of products available in general to students, and of these products, very few (if any at all) were green. We would hope to design posters (like the one we designed to the right) that include different green products that students can easily find at the UW Bookstore, Office Depot, and hopefully throughout campus as well. We would like to place these posters in the libraries and in other buildings on campus in order to show students these alternative products.
Education and Moving Forward

In the future, we would come up with a slogan or a concise message to be used on our poster to get the word out about green purchasing. We will work with UW Facility Services and Management to get permission to effectively hang our posters around the campus especially in areas like Suzzallo Library, Odegaard Library, the Husky Union Building (HUB), and the District Market. We will monitor our posters to make sure it doesn’t get taken down or vandalized. We also have plans to have education on green purchasing start at freshman orientation, transfer orientation, and in freshmen interest groups (FIGs). We want this education to start as early as possible so the idea can be implanted in the minds of freshman that being green is a standard at UW. We would also provide information regarding where students can buy a recycled notebook, since we found out from our survey that not many people know where they can buy green products on campus. Our goal is to provide every incoming student with a recycled notebook, but we are aware that money and budgets are a limiting factor. We would create an easy-access list of all the local and diverse businesses in the area - like in University Village or on the Ave, and make that available to all students. This would make it easy for students to support small businesses because they’d know exactly where to find them, which would hopefully get students to start choosing those products over competing businesses that are less sustainable. Finally, while the University of Washington is attempting to promote green and diverse businesses to the departments, the information is not really available for the students to access. So moving forward, we would want to provide UW students with more options of where to buy green and diverse products and a bigger variety of what those products would be.

Conclusion

The University of Washington is currently only spending around one-tenth of their money on green products, meaning there is room for improvements to be made. With combined efforts from students, faculty, and staff, the UW Community can slowly increase their total spend with green and diverse businesses.
With an educational outreach campaign along with providing UW departments and students with a comprehensive list outlining all the green and BDP companies, it should be easier to encourage people to become more interested in green purchasing.

Thank you to all our partners and resources who provided us with valuable information and helped develop this project into what it is.
Client Partner: JR Fulton Sustainability Director UW Housing and Food Services

Group Members: Victoria Eriksson Russo, Andrew Newton, Jasmmine Ramgotra & Kristen Smith
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PROJECT OVERVIEW

Behavior is what we do when we aren’t thinking. It’s engaging in something that we’re so familiar with, it’s almost second nature. It’s what happens when we get out of bed in the morning and go through the exact same routine every day. It’s so deeply ingrained in our brains that we engage in it time and time again without ever really thinking about it.

Behavior is hard to change. After all, being so familiar with a set of tasks that you do them almost unconsciously takes time. However, behavior can be a powerful tool if it’s sustainable. How much of a positive environmental impact could we create if the whole world instinctively made sustainable choices?

Our group focused on sustainable behavior, or more specifically, how to elicit it. Each team member looked at a specific approach to altering these deeply imbedded habits, and conducted in-depth research in order to understand how to make their approach successful. Our client, JR Fulton, is the Capital Planning and Sustainability Manager for UW Housing and Food Services; he collaborated alongside us in order to apply these approaches to dormitory residents on campus in two ways. First, through encouraging cold water wash in resident laundry facilities and second, in encouraging energy-use reductions. He was extremely supportive throughout the creative process, and encouraged each member to pursue their individual passions in their own creative ways.

Our central question was: How do we inspire environmentally conscious decision making in UW student residents?

Our goal: Create visual final products that promote long-term sustainable habit change in students residing in the UW dorms.

METHODS AND FINDINGS

Research Findings on Habit Change

Since the main aim of this project was to create long-term, environmentally sustainable habit change within students, it was important to present information in ways that would effectively encourage students to change their behaviors. Therefore, we conducted some in-depth research on the psychological and sociological factors that affect human behaviors.
Whilst doing research on how to encourage habit change, we found that educating people on a specific topic by simply presenting facts is not enough. The information has to be tangible, believable, and personalized for the audience in question. Also, one does not need to change attitudes in order to change behavior, because attitudes follow behavior. Thus, if people start participating in more sustainable behaviors (such as cold water wash) their awareness of the benefits will likely follow. When encouraging behavior change, it can be powerful to set behavioral expectations. This can, for instance, be done by giving people reminders or making favorable behaviors easier to participate in. It is also important to remember that people have different values, and different motivations for behaving in certain ways; therefore, by connecting to the values of one’s audience, the message becomes more powerful. Finally, some of the most critical actions that alter behaviors are social norms and peer pressure. Thus, by convincing people that a desired behavior is not only socially accepted, but also the norm, people are more likely to take part in that behavior. Because, naturally, nobody wants to be the odd one out.

**Emotion-Based Approach**

When we first met with JR, he suggested that we concentrate on encouraging students to wash their clothes in cold water, as a greener purchasing choice. Cold-water wash had never been promoted at UW before and there was potential to save a large amount of energy on campus without any expense for students, and just a turn of the dial on a washing machine. After doing some initial research on the facts of cold water versus hot water wash, we learned that heating the water in a washing machine accounts for 90 percent of the energy used to operate it. We also found out that less than 40% of Americans actually wash their clothes in cold water. We wondered why this is, especially after we read that washing in cold water will not bleed colors or shrink your clothes, but hot water can.

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If cold water was obviously the better choice then why are so many people using hot water to wash their clothes? We found out that until recently, detergents needed hot water to work and get clothes clean. Lucky for us, both washing machines and detergents have become more efficient and washing clothes in hot water is no longer necessary. Unfortunately though, after washing clothes in hot water for so long, it has become a habit for many people. We learned that people’s habit of washing clothes in hot water and their reluctance to change was called a barrier.

The emotional-based approach was designed to address this barrier in a modern context through the form of a short film. It was also meant to capture the energy and feelings of college while displaying social norms. To do this, the video was filmed in the Maple Hall laundry room, a setting that would be familiar to most student residents. The storyline of boy meets girl was also familiar so that the viewer would be able to see himself or herself in the film. Since the laundry machines on campus only say ‘brights, darks, and whites’, the boy in the video uses this piece of information as an icebreaker to talk to the pretty girl he sees. A lighthearted, flirty conversation between the two actors then follows in which they casually discuss the benefits of using hot versus cold water to clean their clothes. They laugh and decide to go for a walk around campus to pass the time as they wait for their laundry to finish. The viewer watches them connect through a spontaneous new encounter and hopefully is able to visualize a time in college when they might have a similar experience. The film ends in a scene where some time has passed and we see the girl laughing on her cell phone, presumably talking to the boy she has grown closer to. Text appears on the screen and casually invites the viewer to possibly try something new-to use cold water wash and protect the clothes they care about.

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Information-Based Approach

One of the ways to encourage students to use cold water wash was to create an infographic on the topic. The hope for this infographic was that it would be put it up in all the on-campus laundry rooms around the University of Washington. When creating the poster, it was important to present information in a way that would encourage students to change behaviors. The infographic about cold water wash was created with the free online tool “Piktochart” and is shown in more detail in figure 1 to 5.
In the first part of the infographic, the heading was worded in a way to make people believe that cold water wash is something modern and common. The background information\(^9\) was used to make the poster and following information seem believable.

Figure 3: Middle section of infographic

The middle part of the infographic focused on presenting information about cold water wash\(^10\)\(^\,\)\(^11\) in a way that would connect to people’s values and behavioral motivations. It was found that highlighting the benefits of stain removal and clothes durability in cold water wash is more effective than energy savings\(^12\). This is why the negative effects of hot water on clothes’ size, colors and stains were presented before the energy benefits. Also here, the heading tried to convey cold water wash as being the norm.


When carrying out this project, it was found that the UW on-campus laundry machines do not have traditional “cold”, “hot” and “warm” settings. Therefore, the information in figure 4 was included to get rid of barriers keeping people from using cold water wash.

Lastly, facts about cold water wash were presented to connect to concepts students care about and relate to13 14.

Reminders/Expectation Based Approach

Why are reminders effective? Because they set up behavioral expectations15. When people realize that a certain place (building, office, home etc.) has a set of expectations and requirements for


those who interact with that space they will be much more likely to follow those expectations, especially if they see and experience other people practicing those expectations.\(^\text{16}\)

We decided to design sticker decals that will be placed directly on washing machines in UW dorm residences so that each student that uses a washing machine will see them on a regular basis. The dorm machines do not specify that a wash is cold, so the message “brights = cold water wash” directly relates to the cycle that will always use cold water on those particular machines. The messages included in the decal designs also set up the expectation that cold water wash is the norm among UW students, and aim to get the attention of eco-minded and indifferent students alike by relaying different messages. For example the first design targets both audiences at once by highlighting the benefits of cold water wash and the energy saved.

![Image of a sticker decal with the message: Keep Colors BRIGHT! Keep sizes RIGHT! Save up to 90% of the ENERGY to wash. "BRIGHTS" CYCLE = COLD WATER WASH!]

The second design targets those who care about increasing the length of life for their clothes:

![Image of another sticker decal with the message: Take care of the clothes you care about. "Brights" cycle = cold water wash.]

And the final decal specifically targets students by convincing them that cold water wash is the norm, and that UW Huskies are too smart to waste energy using any setting other than cold.

**Why would we waste energy fading and shrinking our clothes?**
Real Huskies use cold water wash!
#brightscycle #sustainableuw #smarterthanthat

**Incentive based approach**

The final approach to this project incentivized dorm residents to look at their energy use as a whole. By collaborating with JR, a system called “MyLucid” was designed, by which residents who saved Housing and Food Services (HFS) money on utilities could be rewarded with “points” to spend on various rewards such as money, parties, and prizes. The goal of this approach was to promote sustainable behavior change by attaching a direct monetary benefit to saving energy.

This was a design project, meaning development involved asking residents for their opinions throughout the design process. This was done to better understand how the design influenced student behavior. At first, interviews were conducted to determine the strength of the overall idea and decide what platform the project should be on, which resulted in an app being developed.

Due to the scope of the project, we focused on development of the app, but determined from resident feedback that the best course of action would be to also develop a simplified version of the app’s “reward shop” in the form of a MyUW widget.
Once it was determined that we would be focusing on a phone app, we developed wireframes. Wireframes are an industry tool that give a rough digital demonstration of what a product might look like. The wireframes were developed based on user feedback. The final version of the app included the full “reward shop” features, as well as an outline of two other aspects of the app.

The reward shop contained a set of rewards based on resident feedback from the very first interview. Tapping on each reward leads to a screen that lists purchase details, such as any additional

17 HFS Interview (n.d.). Retrieved March 18, 2016, from https://docs.google.com/document/d/14hosT8ooxBIVW_E-vVIWvrGtU1dmXMzAH0osbmATDd0/edit?usp=sharing
action needed on part of the user to claim the reward. Each reward was cleared with JR as something that HFS could logistically support, and supported by residents as something they’d want out of the app.

The app includes two additional features designed for residents who are more invested in the MyLucid system, and might want to go out of their ways to get more points. The first is a “stats” page that allows residents to see their point earnings each day, and the second is a “guide” that lists some of the best ways to save on electricity. Due to the scope of the project, these pages were created with rough designs, but not fully implemented.

The end result of this approach was a system that developed a way for HFS to encourage sustainable behavior change via a very direct incentive based method. The idea behind MyLucid is simply “Be sustainable and get paid.”

NEXT STEPS: IMPLEMENTATION

**Video:** The next step for the video is to show it regularly to incoming UW freshmen and other students that move into UW residence halls. The video is posted on YouTube and is accessible to any party that wishes to show it to students at their own convenience.

**Infographic:** The next step for the infographic is to put it up in the laundry rooms around campus, which is currently underway with UW Housing and Food Services.

**Sticker Decals:** The next step for the sticker decals is for UW HFS to approve the designs, send them out for printing as non-adhesive stickers, and place them directly onto the residence hall washing machines over a series of “work-days”. There are some financial logistics that need to be worked out in order to move this process along.

**MyLucid:** After fleshing out the logistics of how HFS would manage the MyLucid system, it need only be coded and implemented for resident use.

RECOMMENDATIONS FOR UW

After conducting our research and developing our final products we recommend that UW apply some of these methods for behavior change in their own marketing materials for the UW Sustainability Department, the Program on the Environment, as well as the UW School of Environmental and Forest Sciences. When we realize that not everyone has the same attitudes but everyone has the capability to change their behavior (for one reason or another) and we can unite these groups under common goals -
we simply need to find and target those areas of overlap. Everyone does different things for different reasons.

FINAL THOUGHTS

When one person changes their behavior there might be little to no effect, but when that change catches on and becomes the norm (or is thought to be the norm from the outset) others begin to follow suit, and transformative change becomes a true possibility. We believe that through implementing sociological and psychological knowledge to sustainable marketing campaigns we can encourage people in all walks of life to make positive changes in their own habits, for the environment and for themselves.
PAPER SOURCE ANALYSIS AT UW

Group Members:
Brian Goldgeier, Amy Imsdahl, Kelli Katzer

Partners: Claudia Christensen, C.P.M. Procurement Manager &
Sean Schmidt, Asst. Dir. of Communications and Programs at UW Sustainability
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Main Point
Introduction & Background

Early on in the quarter, our class was introduced to multiple client projects that focused on sustainability in green labeling and marketing around the University of Washington. From the presentations, our group was most interested in Claudia Christensen and Sean Schmidt who work with UW sustainability. Their work with sustainable paper inspired us to investigate different types of sustainable paper around campus.

After we were assigned our clients, we met with Claudia Christensen and Sean Schmidt, plus the executive director of the Washington Pulp and Paper Foundation (WPPF). They explained to us that the Washington House Bill 2287 mandates all state agencies (including UW) use 100 percent post consumer recycled paper (PCR). We were told that paper use on campus is difficult to enforce and that only about 70 percent of campus uses PCR paper but that there was an effort to increase compliance with the law.

Mike Roberts explained that his program and NORPAC (North Pacific Paper Corporation) recently developed a new type of copy paper that was not PCR, but still sustainable. They called it Natural Choice, and while it is virgin paper, they claimed that it was more sustainable because of the way it is manufactured. He described the paper as being made in a similar fashion to newspaper and that because of this, it has similar qualities as newspaper (i.e. slightly off white color).

Following our discussion with Mike Roberts and our client, we talked about our role in the project. The overall goal for the project was to convince the College of the Environment to support Natural Choice and potentially present our findings. The clients wanted to structure our project on three aspects: sustainability, performance, and cost. We felt that it would be difficult for us to investigate into the science of the sustainability of the paper simply because none of us had a background to allow for a thorough understanding. We did, however, conduct basic research into how the paper is manufactured and what aspects of sustainability it upholds. We decided our main objective, and the bulk of the project, would be a performance review in which we got several departments around UW to use the paper and fill out a survey that focused on the quality of the paper, sustainability and cost.
Methods

Based on the time constraints of the project, we decided to conduct a two-week trial of Natural Choice paper. Thanks to Mike Roberts, we were able to quickly obtain a crate of paper to send to the departments participating in the trial. The departments that participated were the Office of Sustainability, where Sean works, the Office of Planning and Management, and the Environmental Studies Department, which the three of us are in.

During the two weeks of the trial, we began working on the post-trial survey we created it in Google forms and at the end, we had 12 questions that consisted of multiple choice and short answer. We also decided to take the time to do some research on the science and sustainability of Natural Choice.

Key Findings

Sustainability:

NORPAC has a lot of information on their website on how their paper is made so we gathered some of it to get a better understanding of whether or not the paper is sustainable. As stated above, Natural Choice is made with a different process than PCR paper and most other virgin papers. We wanted to compare the two methods of papermaking and we found that Natural Choice is made using Thermo-mechanical pulping while most paper is made using chemical pulping. It was difficult to find a great breakdown of the two processes, as they are very complicated. Thus, the following is a very basic overview. Chemical pulping involves cooking the paper at a high pressure and temperature using chemicals to break down the wood or recycled paper into fibers, and if it is PCR, to remove inks and glues from the recycled paper. Once the paper is broken down, it is strained to remove any lingering inks and other contaminants. The leftover fibers are then remade into new paper, and in some cases the paper is bleached to give it a bright white color. One problem with this method is that while the paper
is being pulped, the chemicals can render some pulp unusable so it is not a perfectly efficient process.\textsuperscript{18}

Thermo-mechanical pulping is a process that historically has been used to make newspaper but NORPAC altered it slightly to make copy paper. The process involves heating wood chips and then grounding them between a steel disc and a metal plate that are lubricated by water. The heat generated along with physical grinding helps to break down the chips and separate the fibers. The pulp is then sorted and made into paper. This process is much more efficient than chemical pulping because almost no fiber is lost.\textsuperscript{19} Natural Choice says that 98 percent of a harvested log is made into paper and that compared to 30 percent PCR paper, Natural Choice uses 33 percent less virgin wood.\textsuperscript{20} They claim that they can get twice the paper that chemical pulping can from each tree. Therefore producing Natural Choice paper is equivalent to using 54\% recycled paper in terms of amount of wood used.\textsuperscript{21} Natural Choice paper is also totally chlorine-free (TCF), which indicates it is not bleached with chlorine to give it any color. This is why Natural Choice has an off-white color while also being safer for the environment without the use of chlorine.\textsuperscript{22}

Natural Choice also has a Sustainable Forestry Initiative (SFI) label, which means it is sustainable and performs responsible forest management practices. SFI is a nonprofit certification that includes “measures to protect water quality, biodiversity, wildlife habitat, species at risk, and Forests with Exceptional Conservation Value”.\textsuperscript{23} NORPAC also gets 87 percent of the electricity it uses to make paper from renewable sources, most prominently wind energy.\textsuperscript{24}

\textbf{Survey:}

\textsuperscript{19} Types of Pulping Processes.
\textsuperscript{24} Natural Choice Customer Presentation. (2016).
Following the two-week trial, we e-mailed our survey to the various departments to give us feedback. We received eleven responses. Five were from the Office of Sustainability, five from Program on the Environment, and one from the Office of Planning and Management. Of these eleven responses, two were unaware that they were using Natural Choice during the trial period. For our first question, we showed the participants four pictures of different paper packages. These were Office Depot’s Envirocopy 30 percent PCR, Georgia Pacific’s 100 percent PCR, Natural Choice, and Earth Choice. We asked them to pick one paper solely based on packaging. The results are as follows:

![Figure 1. Product Packaging](image.png)

We wanted to gauge several factors of the performance of the paper, the results of which are in Figure 2. We asked if people were satisfied with the color and brightness of ink when printed on the paper. We also wanted to know if anyone cared or even noticed that the paper was not a bright white. Natural Choice paper turns a yellow color over time when exposed to light, which we wanted to see if anyone noticed. We guessed that not many people would notice this change because it usually takes longer than two weeks for this to fully take place. NORPAC also claims that its paper has a high opacity so that there is less bleed through when printing double-sided. We asked people if they printed double sided if

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they noticed any bleed through more than normal. Finally, we wanted to make sure Natural Choice worked in all printers and copiers so we asked people if they had any unusual problems with jamming. Based on our results, we found that the majority of participants were generally satisfied with the paper’s performance.

![Performance Quality Table](image)

**Figure 2. Performance Quality Table**

Finally, we asked people if they would consider using Natural Choice permanently. A sample of answers are below in Figure 3. The general sentiment was that people would consider using it more, especially if they got more information about its sustainability and cost. A couple people did say they wanted to use PCR paper instead.

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Research Analysis

We value our data; however, we do understand that our trial was short and did not have a large sample size. Those who participated in our research were chosen based on recommendation and the fact our group is a part of the Program on the Environment. We were limited by the amount of time we had to conduct our survey and by the amount of participants involved. Aside from these limitations, our research acts as a successful first step in analyzing Natural Choice performance quality and reveals important information to consider when continuing this type of trial in the future.

Recommendations

The goal of expanding the legislative bill is to allow state agencies the option to use Natural Choice as a sustainable paper alongside PCR paper. During our group project, we

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learned that Natural Choice is sustainable because of the lab tests performed by Mike Roberts and his team. Furthermore, we discovered that there are little to no issues with the paper’s performance through our usability trial and performance survey. While we believe that Natural Choice is sustainable, we were not able to gather enough information to say whether or not it is better than PCR paper. We believe that both are sustainable and have pros and cons and it is up to the consumer to determine which type of paper better fits their framework for sustainability.

The following recommendations are for Mike Roberts and Norpac:

Conduct a large trial with multiple departments:

While Mike Roberts and his team have performed extensive lab research into Natural Choice’s sustainability, they should consider conducting a longer performance trial with more departments around the University. Following the trial, Mike and his team or the office of sustainability would follow up with an extensive performance survey and conduct individual interviews to obtain more qualitative data.

Reconsider how to market “virgin” vs. “PCR” paper:

For NORPAC, we recommend that they review how Natural Choice paper is marketed. In our packaging survey, we received split results among the four paper products we presented. We hypothesize that this result was due to Earth Choice’s extensive green labeling and certificates that were located on its packaging. Furthermore, we think that people are more attracted to the word “recycled”. Natural choice should consider altering their packaging to inform the consumer why their product is also a sustainable purchase.

Next Steps

Due to the limited amount of time we had to work with this project, our next steps involve collecting more quantitative data through a second Natural Choice paper trial using a larger sample size over a longer period of time. Concluding the trail, we would provide a more thorough survey on the paper’s performance as well as conduct interviews to gather more
information on individual preferences for various departments. Within the survey and/or interview process, we would also like to repeat our packaging preference question but include the prices of the products to see whether or not there was a change in responses when considering cost.

**Main Point**

Through a comparative examination of the survey and supplemental research, we discovered and believe that Natural Choice paper is a viable option to be included in House Bill 2287. Extensive lab research conducted by the Pulp and Paper Foundation has shown that Natural Choice is a sustainable product. Our qualitative research showed that the performance of Natural Choice is comparable to other sustainable paper options.
Assessment of Compostable vs. Reusable Takeout Containers

Client Partners: Clive Pursehouse & Kara Carlson

By:
Caroline Suttie
Julia Bucy
Mallory Culbertson
Anastasiya Lavochina
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Background

Introduction

In an effort to move toward more sustainable dining options, the University of Washington dining centers currently use compostable containers, utensils, napkins, and other dining essentials. However, the volume of waste produced from compostable products has increased overall compost waste, and alternative options are being considered to lower environmental impacts. Many Universities have adopted a reusable takeout container system to reduce dining waste. In our report, we are evaluating various reusable container suppliers as well as the financial and environmental impacts of using a reusable versus a compostable takeout container to provide a final recommendation to our client partners.

Objectives

1. Perform a cost-benefit analysis of reusable vs. compostable takeout containers.
2. Compare the environmental impact of reusable containers vs. compostable containers.
3. Choose at least 2 manufacturers of reusable containers and analyze which is more suitable for the University.
4. Learn how to interact with a client and become more aware of the costs and benefits of green purchasing.
5. Provide a presentation and a tangible report that details our findings and recommendations on whether reusable containers are worth using over compostable containers.
6. Obtain data and important information from other universities who have implemented the takeout container systems.

Methodology

To be able to implement the reusable takeout clamshell program, we determined the process for using reusable containers, analyzed two reusable container manufacturers, and compared different collecting systems.
## Suppliers

Table 1. Description and Price Comparison of Suppliers

<table>
<thead>
<tr>
<th>Description</th>
<th>Eco-Takeouts</th>
<th>Preserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Sizes</td>
<td>At least 50% recycled content</td>
<td></td>
</tr>
<tr>
<td>Flat or domed top</td>
<td>Universities currently using Preserve:</td>
<td></td>
</tr>
<tr>
<td>Option to customize with logo</td>
<td>Brandeis University &amp; Continuum Babson College</td>
<td></td>
</tr>
<tr>
<td>Over 504 schools around the nation use Eco Takeouts</td>
<td>Colors: clear &amp; green</td>
<td></td>
</tr>
<tr>
<td>Colors: white or green</td>
<td>Made in the USA; manufactured in and ship from Evansville, IN</td>
<td></td>
</tr>
<tr>
<td>NSF- national state food federation; Certify products to make sure they are safe and durable</td>
<td>Maximum sealability to minimize leaks</td>
<td></td>
</tr>
<tr>
<td>Leak-Resistant Designs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Polypropylene plastic (#5)  
BPA Free, Dishwasher safe, microwave durable  
Compatible with OZZI machines  
100% recyclable

| Price per container* | $4.29 | $3.70 |

*per bulk pallet/dozen of estimated 2,880 containers

### Reusable Takeout Container Process

The intended process of using and reusing the takeout container system is as follows:

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1. Students buy into the program for $5, receiving an indicator on their student ID card.
2. The student is given a takeout clamshell to fill with to-go meal.
3. To return the used container, the student can bring back the empty takeout clamshell to a return bin nearest their location (resident hall return bin or bins within dining centers).
4. The student is able to receive a clean reusable takeout clamshell when purchasing their next to-go meal.

Collecting Containers

The OZZI System

OZZI is a collection machine intended to hold students accountable to return reusable containers while minimizing additional staff monitoring. Students buy into the program by purchasing their first container. They can then insert a used container into the slot of the OZZI machine and retrieve a token, which will provide students with a new reusable container the next time they place a takeout order. The reusable containers are then collected, cleaned, properly sanitized, and reused up to 300+ times. OZZI holds approximately 125+ containers and 200+ tokens, and alerts staff when it requires emptying. Purchase and rental options are available at about $18,000.00 and $399.00/month respectively. Many Universities are currently using this system at their dining centers.

Alternative Return Bin System

Many universities have adopted their own return bin system. This system is more affordable, and allows universities to purchase multiple bins, with their own manufacturer/supplier preference, to place in various locations around

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31 S. Mariani, email interview, Feb. 25, 2016
campus (dining halls, residential halls, outdoors, etc.). While the start-up cost is more affordable in comparison to the OZZI system, more staff monitoring is required in order to continually empty containers and return them back to washing facilities.\textsuperscript{33}

**Reusable vs. Compostable Findings**

**Previous Study Comparisons**

The relative environmental impacts of reusable and compostable takeout clamshells depend heavily on the number of uses each reusable takeout clamshell sustained before reaching its end life. In a lifecycle study performed by University of California Berkeley comparing compostable and reusable clamshells, it was found that a reusable clamshell required 14 reuses before one clamshell generated the greenhouse gas (GHG) emissions, energy, and material waste of an equivalent amount of compostable takeout clamshells.\textsuperscript{34} However, the water footprint for reusable clamshells remained greater than compostable clamshells overall. This study included both the raw materials acquisition and manufacturing phase as well as the consumption phase of both containers. Based off of the lower environmental impacts of GHG contribution, energy consumption, and material waste, as well as the potential for improvement in water consumption, reusable clamshells revealed to be a sustainable takeout clamshell choice over current compostable containers.

**Price Comparison**

*Table 2. Price Comparison of Reusable and Compostable Containers*

<table>
<thead>
<tr>
<th></th>
<th>Eco-Takeout</th>
<th>Preserve</th>
<th>Compostable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price per container</strong></td>
<td>$4.29</td>
<td>$3.70</td>
<td>$0.24</td>
</tr>
<tr>
<td><strong>Number of containers</strong>*</td>
<td>2880</td>
<td>2880</td>
<td>2880</td>
</tr>
<tr>
<td><strong>Total Pilot Price</strong></td>
<td>$12,343.00</td>
<td>$10,656.00</td>
<td>$691.20</td>
</tr>
<tr>
<td><strong>Uses per Container Life-Cycle</strong></td>
<td>360</td>
<td>360</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Life-Cycle Price Cost</strong></td>
<td>$4.29</td>
<td>$3.70</td>
<td>$86.40</td>
</tr>
</tbody>
</table>

*Number of Containers based on one dining center for a 1-year pilot

\textsuperscript{33} Samantha Lubow, telephone interview, Feb. 27, 2016.

The initial cost of purchasing a reusable container is greater than a compostable container, with an increased initial pilot investment. However, the total life-cycle cost is significantly decreased when a reusable container is reused up to 360 times before it can be properly recycled. Based on initial investment cost in Table 2 and yearly maintenance costs of every other year, reusable containers would become more cost effective between 2 and 3 years after implementation.

Other Universities

Oregon State University (OSU)

At OSU, Eco2Go is a UHDS program that provides residents and customers with reusable take-out containers. Initially, Eco2Go was a voluntary program in 2012, where students bought an Eco-Takeout reusable container for $7.00 and participated in a token exchange program, receiving a $0.20 discount per container use for participating. In their first year, OSU was cost-neutral, with consistent student participation in the first 3 years. This success enabled Eco2Go to become the new takeout container standard since Fall Quarter 2015. Since using Econowtech containers and an alternative bin collecting system, they have estimated greater student use. Out of an estimated 11,000 containers, around 7,000 were returned to collecting bins and dining centers in Fall 2015. OSU is estimate to payoff the reusable container investment, including all collecting bins, within 2-3 years. Overall, OSU staff recommends reusable container systems over compostable containers to reduce overall material waste material.

University of California Berkeley

Cal Dining at the University of California Berkeley have a Chews to Reuse reusable Eco-Takeout container system which began as a student led project 5 years ago. The students found that compostable containers need heat and moisture to break down efficiently, meaning the containers that end up in landfills take significantly longer to decompose. The Chews to Reuse container program is meant to eliminate the landfill process. Additionally, the cost of using a reusable container per semester is more affordable than the cost of a disposable compostable container. Students buy into the system per semester for $5.00, and bring back

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36 Chris Anderson, telephone interview, Feb. 25, 2016
rinsed containers to the cashier to receive a replacement. The Chews to Reuse program has a return rate of about 80%, using an alternative collecting bin system. Overall, the reusable container system has been successful at reducing waste and keeping students engaged (Samantha Lubow, telephone interview, Feb. 27, 2016).

**Student Survey**

Our team surveyed a total of 50 students (10 at lunch, 40 at dinner) at Local Point and asked 4 questions related to a possible reusable container system. Overall, many students seemed interested in the program and would be willing to participate. From student feedback, a concern among students was returning of the reusable containers.

*Figure 1. Survey Results from Local Point Dining Center*

<table>
<thead>
<tr>
<th>Q1: Do you ever take food to go?</th>
<th>Q2: Does having access to a reusable plastic container interest you?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="chart1.png" alt="Q1 Chart" /></td>
<td><img src="chart2.png" alt="Q2 Chart" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3: Would you be willing to pay a small fee (approx. $5), for the use of a reusable container all quarter?</th>
<th>Q4: For this system to work, you would have to return your container at a dining hall. Knowing this, would you be interested in implementing this system at UW?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="chart3.png" alt="Q3 Chart" /></td>
<td><img src="chart4.png" alt="Q4 Chart" /></td>
</tr>
</tbody>
</table>
Final Recommendations

Our team recommends Eco-Takeouts as the manufacturer of choice for the reusable takeout container program. This manufacturer is NSF approved, and provides customizable options to fit the University’s needs. We recommend both the large and small flat top containers options with a UW logo decal. Also, EcoTakeouts customer service was easy to work with and provided a welcoming experience. Eco-Takeouts is compatible with the OZZI system allowing future opportunities to expand the program. Overall, Eco-Takeouts has more experience with large scale Universities comparable to the University of Washington, and would allow the UW campus to reliably implement this system in their dining centers. In terms of collecting reusable containers from students, we decided the most cost efficient approach would be to use the alternative collecting bin system. This allows us to purchase more bins and create more drop off locations for student convenience.

Considerations

Cost Considerations

Each manufacturer provides options to either work together with the OZZI system or an alternative collecting bin system run by the University. Figure 2 displays all the options available for each takeout container selection.
Labor Considerations

To increase the success of the program, our team suggests hiring more dishwashing staff members to accommodate increased incoming containers. Additionally, hiring other regular staff members could help with container collection.

Water Consumption

Reusable takeout containers will further increase water expenditure on campus. While it is not possible to use less water than compostable containers from an operational standpoint, the trade-off seems reasonable when considering the adaptable impact. Unlike GHG emissions or energy consumption whose impacts occur largely within the raw materials acquisition and manufacturing phases, the largest water footprint occurs within the consumption phase\textsuperscript{37}. Therefore, UW dining can significantly improve the water footprint of the reusable containers through modifications in their water conservation practices.

Conclusion

Overall, the reusable container system has the potential to become a successful program at the University of Washington. Aside from water consumption, the reusable takeout container system has a smaller environmental impact than compostable containers. With cautious water conservation practices, reusable takeout containers could become a viable option. This report helps provide guidance for the UW campus to make more conscious purchasing decisions and provides a progressive step toward more environmentally friendly dining practices.

Waste Side Story: A Sustainability Rivalry

Dehydrator vs. Biodigester

Authors:
Cristina Arias        Jenna Duncan
Susanne Gov          Kevin Hua

Client: Kara Carlson
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Overview

Our goal was to analyze the benefits of an industrial biodigester versus an industrial dehydrator to manage food waste in the redevelopment of the North Campus dining facility. Housing and Food Services (HFS) is looking to integrate food waste management equipment into the remodeling of McCarty Hall where the new North Campus dining hall will be located. Reviewed here is:

- a determination of which food waste operation is preferable,
- the cost-benefit analysis of a dehydrator versus biodigester, and
- analyses of additional methods.

Composting via food waste collection by Cedar Grove is the current operation for the University of Washington. Under further examination, we hope to replace it with a more sustainable method of dealing with food waste. Our client Kara Carlson was Business and Sustainability Manager for Housing and Food Services at UW. Based on the initial analysis our hypothesis is that the dehydrator model we chose for this analyses will be the best option for the North campus dining facilities on the University of Washington campus.

Methods and Findings

In order to determine the cost of the current operation of food management at HFS, we looked at the data provided by our client, including the logistic numbers for transportation costs to Cedar Grove. We calculated the amount of food waste transported, the monetary cost of transportation, and the amount of pollutants emitted due to waste transportation.

According to the EPA Emission Facts document by the Office of Transportation and Air Quality, the amount of pollutants emitted by garbage trucks alone is 16.3 tons per year. The monetary cost of transportation is dependent on the weight of the waste being transported. Our team estimated approximately 445 tons of food waste, 11,841 pickups, and $61,568 spent per year. Based on these

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findings we determined that HFS was searching for a more cost-effective and energy efficient waste management method to integrate into the remodeling of McCarty Hall.

**Background on Biodigesters and Dehydrators**

Biodigesters convert solid food waste into liquid effluent and chemical byproducts that are disposed through a drain into the city’s wastewater management. Biodigesters are unable to process non-food waste such as compostable to-go containers and cups. Given that students already have difficulty sorting waste, to invest in a biodigester would require additional staff to sort waste and since the biodigester is unable to deal with non-food waste, pickups to Cedar Grove would still be a requirement.

While biodigesters convert food waste into liquid effluent and chemical byproduct, dehydrators can handle non-food waste, remove all the water from the compostable food waste which reduces it by 85 to 95 percent in weight. Although Cedar Grove would still need to pick-up the byproducts, the weight would be significantly reduced resulting in fewer pick-ups.

While researching these two products we also came across an additional product called an in-vessel composter. An in-vessel composter only has the capacity to process food waste, not compostable to-go containers and cups. However what makes this product unique is that it has the ability to turn the food waste into a compost soil amendment, which can be used for landscaping on campus or on the UW farm. Any extra compost can be donated to the local community.

**Biodigester**

We chose to examine the Enviropure brand of biodigester, which had the appropriate capacity for UW’s North Camus and in particular a wet system. A wet system is an anaerobic process that uses biological enzymes to breakdown the food producing methane and carbon dioxide inside of the biodigester. There were two different models: the GT series that works under a batch system, and the i Series that works under a continuous feed system. Continuous feed models do not require a set amount of waste before disposal like a batch system, and it allows the user to remove any non-food waste in the unit before it gets processed. However, one of the cons of the i Series is that the dispenser entry is only 7 inches in diameter. Given the large amount of waste UW produces, it would require much more time to insert it into the machine and may require additional labor. Although the batch system does have a entry large enough to throw away food waste directly from a 32 gallon garbage can, the waste must be
properly sorted before dumping. Based on the characteristics of UW waste in Housing and Food Services, it was decided that a continuous feed system would be the better choice.

A unique characteristic of a biodigester is that it breaks down food into liquid effluent. This is done using a proprietary BioMix, an amendment that aids bacteria in decomposition, turning food waste into liquid effluent and CO$_2$\(^{39}\). Daily CO$_2$ emissions are displayed and reported with the iSeries. According to the vendor, CO$_2$ emitted can range from 300-1000 ppm, depending on whether the machine will be installed outdoors or indoors. Effluent discharged from the machine contains BODs (biochemical oxygen demand), and FOGs (fat, oil, and grease) which would require a yearly permit of $17,000 if the disposed effluent is greater than the annual municipality limits. The size of the machine is 8 feet by 9 feet, and it requires 4-7 gallons per minute while loading, and electricity costs are estimated to be $967 per year\(^{40}\). The Enviropure model EPW-2000i costs $40,000, according to our best estimates. Installation and transportation are $6,400, the BioMix that is required every six months would total $117 per year. Assuming the amount of labor is part time, the cost would be $19,500 per year. All things considered, the starting year would cost $83,979. Figure 1 illustrates a more detailed cost-benefit analysis for Enviropure Biodigester as described. A return on investment is expected within three years of purchase.

**Dehydator**

A dehydrator is a machine that pulps food waste and extracts water. Less transportation to Cedar Grove is required because of weight reduction. Dehydrators work in batch systems and each load would require 8-11 hours to complete its cycle\(^{41}\). The brand and model we selected, Gaia Recycle G-1200H from Ecco Technologies, was one of the few on the market that has the appropriate capacity for our study, however the representative at Ecco Technologies advised against it for our purposes. We have included information for comparison and feasibility.

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Gaia Recycle G-1200H can process up to 2.6 tons of food waste per day and reduces the total weight to $\frac{1}{8}$ of the original input\textsuperscript{42}. It does not require any additional water or additives as it simply removes the water from the compost. A major benefit to using a dehydrator is that it can accept compostable containers and silverware. The cost for the Gaia Recycle G-1200H costs is approximately $200,000 and requires an estimate $11,664 worth of electricity annually. Labor costs would be $19,500, assuming part-time, and installation would be $3,500. Total initial cost for the first year would be $251,664. Figure 2 includes a cost-benefit analysis for the Gaia-Recycle Dehydrator. The return on investment would take 5 years.

In-Vessel Composter

An In-Vessel Composter was not part of the initial study, but was found along the way during the research. The representative with Ecco Technologies recommended that we consider an in-vessel composter as part of the cost-benefit analysis for the North Campus dining halls. This equipment pulps food waste and converts it into compost over the course of 6-10 weeks through aeration and natural decomposition\textsuperscript{43}. Food waste is emptied daily into the machine and finished compost automatically unloaded into a collection bin where the compost is ready to use, or can be placed in maturation bays\textsuperscript{44}. It is also vital to note that the In-Vessel Composter is the only food waste system that can produce a


\textsuperscript{44} Ibid.
compost soil amendment researched in this study. We chose the in-vessel composter with the largest capacity, the Big Hanna T480 from Susteco AB.

The Big Hanna T480 has the capacity for 2.6 tons of food waste per week. The Big Hanna cannot accept compostable containers or silverware and the cost for this particular in-vessel composter is $154,000. Washington State Department of Ecology requires a permit\textsuperscript{45}, which is $800 annually. Annual electricity costs would be $3,032. Labor costs would calculate to about $19,500 per year at a rate of 25 hours per week at the Seattle minimum wage. There would also be a National Pollution Discharge Elimination System (NPDES) permit\textsuperscript{46} that would fall under the Standard Industrial Classification (SIC) code of Organic Chemical Fertilizers and cost about $17,000 a year.\textsuperscript{47} The cost for the first year is estimated at $194,332. The return on investment is expected to be in 4 years when the net benefits from the reduction in transportation costs are approximately $54,000 per year. Figure 3 describes the details of the cost-benefit analysis. The Big Hanna produces a large amount of compost that will be can be used for landscaping on campus, used on the UW farm and even donated to the community for personal gardening purposes.


Recommendations

Considering the costs, energy requirements, and transportation we would recommend the in-vessel composting system. This was the only product that is a closed system, in which everything that goes into vessel comes out and it can continue to be used. Additionally if the UW transitioned to reusable to-go containers then sorting food and non-food waste could be eliminated. During our research we found schools like McGill University are successfully using the Big Hanna, and have a similar population size as the UW. Furthermore, using the in-vessel composter would be beneficial for the UW farm where they currently purchase most of their compost from Cedar Grove, which would reduce transportation costs for the farm as well. Any additional compost can be donated to the local community and P-Patch gardens in neighborhoods like the University District. Figure 4 breaks down the pros and cons for each of the options we have described.

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Next Steps

We definitely recommend that our client looks further into these options as the UW campus increases in population. Any of these options would be beneficial as the university continues to grow and strive to become more sustainable. Ultimately as stated above the in-vessel composter would be more cost-effective as it requires the least amount of trips to Cedar Grove and would build a stronger, more sustainable community.

Conclusion

Compiling the amount of information needed for this project was one of the most challenging tasks given the amount of time and resources. However, we were able to create a cost-benefit analysis for each of the options featured in this paper because of the in-class readings and research. As the UW continues to expand we hope this research will help provide a tool that can be utilized for a more sustainable campus.

Figure 4: Comparisons analysis for each option. Image created by: Cristina Arias, Jenna Duncan, Susanne Gov, and Kevin Hua.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Cost</th>
<th>Benefits</th>
<th>Drawbacks</th>
<th>Net Benefit</th>
<th>Time for ROI</th>
</tr>
</thead>
</table>
| Dehydrator         | $251,664 | -- Non-food waste
  -- Large input | -- Expensive
  -- Batch system
  -- Company unavailable | -- Less trips to Cedar Grove
  $54,000/year | 5 years |
| Biodigester        | $83,579  | -- Less Expensive
  -- Continuous Feed | -- No non-food waste
  -- Emits CO₂
  -- Small input size | -- Less trips to Cedar Grove
  $54,000/year | 3 years |
| In-Vessel Composter| $194,332 | -- Large input
  -- Produces compost | -- Expensive
  -- Batch system | -- Less trips to Cedar Grove
  -- Compost as end product
  $54,000/year | 4 years |
Hazardous Chemical Waste Disposal

Jenny Renee, Tyler Ung, and Sam Maylor

Client – John Wallace, Industrial Hygienist II, Environmental Health & Safety
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4. Conclusion......................................................................................................................................
1. Overview

The University of Washington is one of the top research universities in the world. There are more than 270 specialized research centers at the UW that explore a huge range of aspects of health and disease, from the molecular mechanisms of gene action to population studies of global illnesses. As part of the process, some of these research labs use and produce substances that are hazardous to human and environmental health, and these must be handled with care and disposed of as cleanly and completely as possible. This is the job of the dedicated folks at UW Environmental Health & Safety (EH&S), without whom we would all be dissolving in pools of toxic sludge. Our group partnered with John Wallace - an Industrial Hygienist at EH&S - with the goal of improving communication between EH&S, the labs they work with, and the student body. We designed and distributed a survey that ultimately aimed to reduce the amount of hazardous waste pollution generated by showing both EH&S and the labs what areas of the treatment and disposal processes aren’t being utilized to their full potential, which pollution prevention programs need wider dissemination, and how interested the labs are in furthering potential in-house treatment options. Our objectives as a group were to improve our data collection skills and strategies, practice presenting quantitative data effectively, and - most importantly - learn to collaborate with a third party client and meet their needs.

2. Methods

We met with our client, John Wallace, to gain background knowledge in order to develop and distribute a survey to a small sample of the EH&S clients that work in the University of Washington Medical Centers. The client survey we developed was intended to be a trial run, collecting information on the chemicals and disposal methods currently used by clients, the Pollution Prevention (P2) programs they are aware of or use, as well as the level of satisfaction the clients have with the various aspects and procedures that EH&S provides (see figure 1). Included in the online survey were questions that identified their knowledge on specific pollution prevention programs (see figure 2) offered by Environmental Health and Safety, as well as an open platform that enabled clients to suggest areas that EH&S can improve in.

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49 UW RESEARCH GENERATES A FAR REACHING ECONOMIC IMPACT [A UW generated report on how great UW research is for everybody.]. (n.d.). Seattle.
In addition to the online survey we developed, we were interested in exploring an educational element to our project. In general, the processes of chemical hazardous waste disposal are widely unknown to much of the public, including those who contribute to it. By using EH&S offered P2 Programs, not only are we working towards a more sustainable university environmentally, but as importantly, a sustainable business. Reusing chemicals or conducting in-lab distillations, for example, can be much more cost-effective methods than having the waste picked up and disposed of by EH&S, and then needing to restock those chemicals. However, implementation of these P2 programs could significantly reduce those costs. With the savings, resources could be more efficiently used, for instances, distributed towards social benefits, like pay-raises, or further investment on research. Such benefits that come with these sustainable changes on a large scale have a lot of potential that EH&S acknowledged should not go under the radar.

We first toured the Hazardous Waste Storage Building, where we got the opportunity to see firsthand where the chemical hazardous waste is received, processed, recycled, distilled, and prepped for pick-up. One of EH&S current contractors, Clean Harbor, takes the majority of these chemicals to either an incinerator or landfill out of state. EH&S attempts to reuse and recycle as much of the hazardous waste they can, as well as redistribute whenever possible to third parties.
With the information we gathered over the course of this project, we found that a video was the most applicable outlet to bring awareness to the chemical waste generators and the general public about the process of chemical waste disposal and the benefits of potential future involvement between EH&S and the sustainability studio. The video is meant to be an entry-level documentary that will be publicized on Environmental Health and Safety’s website.

3. Results

We initially sent out 22 surveys and received 7 responses back. Our sample size was small to begin with; however, the participation was unexpectedly low. Our results showed overall, those surveyed were very satisfied with the timeliness, accessibility, and safety of EH&S. We gave each answer the following scores; quite satisfied – 5, satisfied – 4, neutral – 3, unsatisfied – 2, quite unsatisfied – 1 and averaged the scores (see figure 3). Just under half of the clients who responded were interested in implementing solvent recovery in lab.

![Average Satisfaction Score](image)

*Figure 3 – results from the satisfaction question*
4. Conclusion

The client survey successfully trialed the usability and information of a survey, and will provide valuable information that better connects the EH&S office to their clients, as well as students at UW. Our survey, with a few small improvements, along with our educational short-documentary, will equip EH&S to be able to successfully utilize a similarly designed project to be produced on a much larger scale. This will help promote alternative means of hazardous chemical disposal to create a more sustainable campus wide norm.

Ideally we would send the survey to anyone who uses EH&S’s services. Perhaps adding an incentive to completing the survey to get better participation, set up the answers to be more easily sorted for data analysis, and decide how to ID each person (as there would be hundreds).

Traditionally, chemical hazardous waste and sustainability would not be associated together, but now we see there is great potential for both to coevolve alongside each other. At such a large, well-funded university, more attention, emphasis, and funding should be given to the disposal of chemical hazardous waste we generate that comes along with the great research we do.

Visit https://www.youtube.com/watch?v=IEkFZ09r1Pw to watch our video. It will be accessible on the EH&S website soon.
Corporate Social Responsibility and UW

Annalee Cappellano, Ian Evans, Phoebe Reid, and Josephine Strauss
Clients: Sean Schmidt - UW Sustainability and Claudia Christianson - UW Purchasing
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Overview

Corporate social responsibility (CSR) is a concept that has been taken on by businesses around the world in hopes of increasing long-term profit, upholding ethics and enhancing community support and involvement. While it is common sense to expect a university to uphold ethical standards and have sustainability concerns, that is not necessarily the case with the companies with which we do business. A supplier code of conduct extends these expectations to those companies and asks them to agree to a set of standards that include everything from fair labor to environmental sustainability. Annually the UW spends over $1.2 billion with suppliers and hopes to eventually have all of its suppliers sign a code of conduct agreeing to central principles.

Surprisingly, CSR is not a common concept on college campuses across the country. The spark for this movement at the UW started in 2011 when Sodexo, a global food service provider, was facing human rights violations accusations. Student groups across the nation, including those at the UW, banded together and began protesting against Sodexo’s unfair treatment of its workers. This resulted in UW's current supplier Code of Conduct, though it has not been operationalized in a way that makes it effective. At the moment the code of conduct is not published anywhere, suppliers do not have to sign it, and if a supplier violates it, there is no process of penalizing in place. Despite this, the UW is still one of the leaders of the pack merely because they comprehensively address most CSR issues.

Despite the large amount the university spends, it is only a fraction of the supplier’s’ overall profits. Even if the UW suspended their business with these companies, very little impact would be made. Knowing this, our group decided to focus on uniting the PAC-12 around a common supplier code of conduct, given that the PAC12 universities use many of the same suppliers (Office Depot, HP, Apple, etc.). The reasoning was that 12 schools banded together would have a much larger influence and pressure companies to share the values outlined in the code of conduct.

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**Methods:**

In order to investigate all of the PAC 12 schools, each of us in the group chose three schools to study. Ian took on the University of Washington, Washington State University, and the University of Colorado Boulder. Josephine took University of California Los Angeles, University of California Berkeley, and University of Southern California. Phoebe was responsible for Stanford, Oregon State University, and University of Oregon. Annalee was responsible for University of Utah, Arizona State University, and University of Arizona. Once the schools were assigned, we conducted our research in various ways. Sean Schmidt provided us with points of contact at each university for us to reach out to. Each of us sent emails to the procurement offices of the schools. In the emails, we introduced ourselves and explained that we were partnering with the UW Sustainability and Procurement Services offices for a project on corporate social responsibility. We then asked each procurement office if they would want to share with us any information on their school’s potential supplier code of conduct. Along with sending these emails to the universities, each of us used online resources to look for standards in their supplier partnerships. We searched through their procurement web pages and their licensing web pages. Questions we were looking to answer were: if the university had a code of conduct in place and if it has a way to respond to supplier non-compliance. We also asked each point of contact what their thoughts were on further discussing a future partnership with the PAC 12 in supplier relationships.

When looking at the codes that other universities held their suppliers to, we compared them to the values outlined in UW’s current Code of Conduct. These values include: labor and human rights, health and safety, environmental sustainability, ethics, legal compliance, monitoring and compliance, community concerns, and supplier diversity. To organize our findings, we included the details on a spreadsheet. These details outlined all the topics each school covered in relation to code of conduct with their vendors. We have included that spreadsheet below for reference.

We held periodic meetings with Sean, Claudia, and Chika to stay up to date on our progress. We had our first meeting on the 21st of January and another on the 29th of January. We then had a meeting with Kyle Richards, who is currently working in the UW Tax Office, but was originally part of the team who started working on the UW Supplier Code of Conduct in 2011. Our meeting with him was helpful in fully understanding what had been previously done towards this effort.

**Findings**

As discussed in our methods section, we reached out to the procurement officers of the PAC-12 schools. This was extremely helpful information as the procurement officers were the individuals most familiar with the school’s purchasing policy. After sending out emails we received responses from seven of the twelve schools. To fill in the gaps in information we looked through the university’s procurement websites. From this research we were able to determine certain factors about schools’ purchasing policies. As a basis, every school in the PAC-12 has a licensing agreement with vendors. Below is the information on each university outside of the vendor/licensing agreements.
To start out, of the twelve schools we looked at, four had supplier standards at some level. What this means is that the school in reference has policies in place that in some way outline expectations from their suppliers. However, very few if any of these policies are operationalized. In other words, the university can ask vendors to follow the guidelines set forth, but they have no authority to discontinue the vendor contract, should the vendor choose to violate the policy. However, some schools had processes in place to open up discussions with vendors should they find issues with a vendor’s practices.

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<th>Policy Category Breakdown by School</th>
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<td>University of Washington</td>
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<td>Arizona State University</td>
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<td>University of Berkeley</td>
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<td>Washington State University</td>
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As stated above, we looked at the school policies based on eight categories. Of all twelve schools researched, only one of the schools had policies or guidelines addressing all eight categories. Below we will discuss each school and their respective policies.

The first school we looked at was the University of Washington. After meeting with Claudia and Sean, they shared a folder with us containing all the work they had completed on the University of Washington Supplier Code of Conduct thus far. From this information we were able to see what the University already had and compare it to the other 11 PAC-12 schools. The current Code of Conduct is very comprehensive and touches on seven of the eight categories we looked at for all the schools. The one category that the University of Washington failed to meet was community concerns. The Code of Conduct is also currently not published on the University website, making it less accessible to the general public. Furthermore, it only touches on two-thirds of vendors that supply the University of Washington. The University of Washington was one of the four schools with some sort of policy related to suppliers, and one of the two schools with a Code of Conduct applicable to suppliers.  

The second school with a code of conduct is the University of Colorado Boulder. Similar to the University of Washington, the University of Colorado Boulder fulfills seven of the eight categories that we looked at in our research. Boulder’s Code of Conduct takes a different approach to monitoring purchasing. Instead of focusing on the suppliers, Boulder’s Code of Conduct outlines the behaviors purchasers at the school must follow. These guidelines mainly touch on ethics, such as not accepting gifts from suppliers. In relation to this, Boulder also has detailed policies on corrective actions for those would do not follow or disregard the outlines set forth in their Code of Conduct. This was one of the few schools that had policies in place to enforce compliance.

Outside of schools with codes of conduct, there were three universities with guidelines in place in reference to purchasing. These guidelines are not as formal or as structured as a code of conduct. The first school, Oregon State University, touched on one of the eight categories we looked at. Oregon State University utilizes a procurement manual, primarily used by purchasers. This manual covers topics on environmental sustainability extensively. Next, we looked at the University of Arizona. Upon researching the university online, we discovered that Arizona utilized a Code of Ethics in their purchasing endeavors. When we reached out to the University of Arizona for further information they forwarded additional information regarding their Code of Ethics, but nothing regarding a code of conduct. However, when we mentioned to them the idea of creating a code of conduct across the PAC-12 they expressed interest and said they would be very open to further discussion, and referred us to their main

51 “University of Washington Code of Conduct.”
office. The third school that had guidelines outside of a code of conduct was the University of Utah. The University of Utah had the more extensive guidelines by far, touching on seven of the eight categories we looked for in our research.55

The remaining seven schools did not have any code of conduct or semblance of guidelines to monitor vendors and suppliers outside of licensing and apparel. Our research showed that across the board there is not really any consistency in guidelines and policies concerning suppliers who are not involved in licensing or apparel. However, the data we did uncover is very reliable as it all comes from the university procurement offices and websites. Some remaining gaps would be in the schools that did not respond to our emails.

**Conclusions and Recommendations**

As you can see, very few of the schools have any semblance of a code of conduct. Even the AASHE Sustainability Tracking Assessment & Rating System (STARS) only has 753 institutions that have participated in their program, of which many do not have current reports, and that is of schools worldwide.56 The US alone has over 7,200 degree granting institutions.57 Granted, many may simply be choosing to not report, but these numbers show a clear indication that our society and culture is reactive versus proactive. Our own school being the perfect example, with the Sodexo incident being the basis for our own code of conduct. They merely incorporated the best aspects from multiple companies’ codes of conducts, which reflected the values and expectations the UW wanted to have of its suppliers.

Part of the whole motivation for our project was the issue with Nike and its sweatshops. From the 1970’s all the way to as recently as 2005, Nike had human rights issues with its suppliers.58 At first they merely brushed off the protests, claiming it wasn’t their company that was directly committing the violations and therefore not their problem. However, students across the country persisted, and eventually forced Nike to respond. This led to the most comprehensive code of conduct that covers nearly all aspects of supplier behavior, and has been adopted by virtually all universities. The problem is it only applies to licensing.

This highlights the importance of unity and seeking a common voice and goal to have companies and institutions reflect the values of the people they serve. Our goal is to take this concept, with a proactive approach, and create the same sort of momentum the Nike protests had to apply the code of conduct to all industries and types of suppliers across the nation.

Based on what we found we did not think it realistic to create a general outline of a code of conduct for all of the schools. We realized that each school might have different needs, and UW’s Code of Conduct is sufficiently general enough to cover all the bases without us reinventing the wheel. Also the lack of enthusiastic response in the PAC 12 made us rethink our goals. We decided to postpone

55 “PO Terms and Conditions.” *University of Utah Business and Financial Services.* Retrieved from http://fbs.admin.utah.edu/purchasing/supplier/po_terms/
56 https://stars.aashe.org/institutions/participants-and-reports/
57 https://nces.ed.gov/fastfacts/display.asp?id=84
58 https://web.stanford.edu/class/e297c/trade_environment/wheeling/hnike.html
pursuing an alliance between them, and instead focus our efforts on starting a local coalition between the universities within Washington. The schools are closer, use many of the same large suppliers, and would have an easier time coordinating with each other. This may also help to establish a model that can then be used to spread across the nation. We will pitch this idea in April to a meeting of the purchasing heads from all of the colleges in Washington.

**Main Point:**

A supplier code of conduct is an essential part of impacting the purchasing practices at a university. One school alone is a drop in the bucket of the sales of a larger company, and would fail to have the influence necessary to force such a company to change its practices. With the data collected here, it can be inferred that a multi-school Code of Conduct would be beneficial. Each of these universities has policies in place to deal with licensing agreements and apparel vendors; however, there is little foundation currently in place within the PAC-12 universities. The goal now should be to continue to reach out to the PAC-12 and Washington schools and establish a working relationship with their procurement offices. Along with this, there should be a joint effort to create a universal Code of Conduct that would make an impact on how suppliers conduct business.
Conclusion

Although many of us like to think that we support sustainable initiatives and endeavors, at the end of the day, it is often our actions – and the dollars we use to take these actions – that speak the loudest.

This term, we learned how important it is to not only assess, but know how to assess, our purchases. We each choose to make a variety of decisions and transactions every day – from what we choose to eat, to what technology we choose to run (and how often we run it) to where we choose to dispose of our waste. Every one of these transactions contributes to the overall cost of our consumption patterns. We need to look at these transactions throughout their entire life cycles, from the raw materials that they come from, to the travel they have to undergo to get to us, to the shops and sellers that we choose to buy these items from.

When we pay for a purchase, the item itself only offers a very small proportion of the amount of time, effort, energy, and materials used to create it. Being an informed consumer has likely never been as overwhelming as it is today. However, we hope that this document provides some basis for your future purchasing decisions.