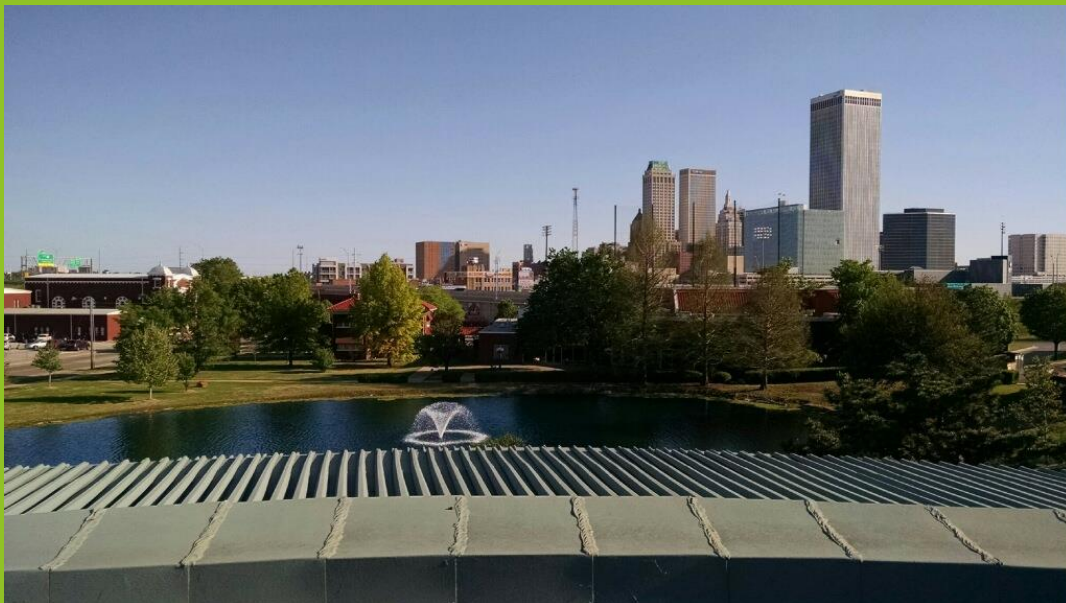




OPTIMIZING SUSTAINABILITY EFFORTS AT OSU TULSA



Cat Rockholt , Honors Thesis for Spears School of Business, 2015

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INTRODUCTION

Why Sustainability? John Poritt, the famous British environmentalist, recently said, “Sustainability is everywhere”. One only needs to look around to see this has never been truer than today. Resource allocation is a top priority for the majority of corporations today and as any economist is quick to point out; there is only a limited amount available. Add to that the recent climate control crisis, and one can understand why “sustainability” is one of the newest buzz words in business. Green movements are popping up with communities, schools, and organizations but what exactly does sustainability mean?

There are numerous definitions but broken down in its simplest form; sustainability is the development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Brantland Report). This excellent application can be streamlined further by the incorporation of the “triple bottom line” of people, planet, and profit, into all levels of an organization. Corporate Social Responsibility or CSR has taken on more of an important role with corporations as organizational stake holders, including customers, are choosing to devote more of their time, talent, and resources to companies that are incorporating more CSR- friendly behaviors. Why? With so many public scandals like Enron and Lehman Brothers putting profits above ethics; people are looking at organizations with new suspicious eyes.

Companies that genuinely are trying to do right by their employees, customers, and the environment tend to be less at risk of falling victim to corruption. Plus, there is also another more superficial reason companies are starting to re-think their approach - genuine CSR focused companies have higher profits and less turnover. It makes perfect logical sense - employees feel the company cares about them and their families, so in turn care about the company and by extension care about customers and will generally be happier and thus more productive. For example, top rated CSR companies such as Amazon, Google, Quik Trip, One Gas and Williams companies routinely have thousands of applications a year to choose from, so are always able to

select the best and brightest from the talent pool. Yes, these companies are known to have high salaries and generous benefits packages but it is also the company reputations that are the biggest draw. For example, Google is known to be supportive of employees by encouraging creative thinking to the point where all employees are allowed 3 hours a week to explore a creative concept. Offices have lounge chairs and quiet zones designated for their employees to take naps, relax whenever they need to recharge their batteries. They promote efficiency to the extent of holding “corporate meetings” in lunch lines! Williams Company, one of the oil and gas giants, offer on-site medical clinic, recreational facilities, and personal chefs to ensure food choices are healthy. Practices such as these show a commitment to conserving and maximizing one of the most precious resources a company can have; human capital.

This same level of commitment is then carried outward to local communities and the environment. Companies that stubbornly stick to profits above all else are doomed to be left behind. Dish-Network, has earned the unsavory title of “worst company” for the past three years, according to a survey from Glassdoor. Employees report being denied breaks and penalized for every second (literally) they are not at their desk. Even their top level management team has a high turnover; which by itself is a giant red flag.

So what does this mean for universities? In order to keep up with the trends and demands, a university must make sure students are well prepared to meet the demands of the current business environment; which includes sustainability. Students need to leave college with a “lean and green” mentality and this starts with the very first time they step onto campus. The biggest areas of sustainability center around energy and transportation but no program would be complete without an effective recycling program.

Sources:

Sustainability - Essentials for Business by Scott T. Young

www.glassdoor.com

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I. Benefits of Waste Reduction

Everything produces waste. According to a 2012 EPA report, Americans generated 251 million tons of trash and recovered 87 million. This equates to about a 34.5% recovery rate or approximately 4.38 pounds of trash per person per day. The remaining 2.9 pounds were deposited into landfills. This is great news and supports the trends that have already been discussed in this paper. Society as a whole, is taking a more serious approach to sustainability and sustainable practices. This trend is not going away - in fact with the recent advancements in waste reduction such as greener landfill practices, incineration, and multi stream recycling, this can only be expected to increase. An interesting development is few people deny reducing and reusing are beneficial but rather which method should be optimized. Incineration is a relatively newer method of disposal where trash is burned into ash and then the ash is sent to the landfill. In this manner, the carbon footprint is thought to be reduced as a smaller amount of landfill space is being taken up. Recycling plants, such as the Tulsa based TRM, argue against this as the ash is often made up of dangerous trace amounts of chemicals that some say will cause more damage to the environment than the actual trash itself. Landfill owners who make their own money by the amount of trash being deposited are less accepting of incineration based practices as they will get more with the deposit of solid waste but most are in favor of simple recycling.

a. National Campus Green Efforts

Increased demand also brings an increase in resources for universities to take advantage of. For instance, the Association for Advancement of Sustainability in Higher Education, or AASHE, has several notable tools for colleges to use. The most popular among them is the STARS (Sustainability, Tracking, and Resource System). Over 700 schools such as TU, OU, Cornell, Purdue, TCC, and Harvard are among those who have implemented the STARS system and are achieving high levels of success.

In fact, nearly 60% of participating schools report they have seen an increase in their campus's recycling improvement. The STARS system is available for free to any interested campus but for a small fee, participating schools have a chance to earn a STAR rating of Bronze, Silver, & Gold. Each participating school receives a set of reporting tools that can easily be added to their social media or websites to help celebrate success.

Besides these two highly used paid resources, there is a wonderful free resource offered by the company Second Nature. Dr. Anthony Cortes started this nonprofit company in 1993 dedicated solely to aiding colleges across the nation with implementing sustainable practices including a recycling program.

Since the company's inception, Second Nature has helped 4000 faculty in over 600 schools start crucial conversations about sustainability to enact lasting campus efforts. The most successful element of this is the nationally broadcast "Campus Sustainability" day which is held in October. Participating schools can view (or participate in live webinars, post videos, share ideas, and celebrate each campus's small or big sustainable accomplishments.



Featured Guest Speaker
Dr. Anthony Cortese

Recyclemania dot com is another fantastic program available and takes place in April of each year. Schools can register to compete in over 60 different categories in this month long blitz and keep the momentum from the fall going. Participating in this program can help rally students to get behind any green efforts, and rally they will. A recent Princeton review survey shows that 60% of college students today will factor in how green a campus is when selecting a college. This could also be explained with findings from a national Graduate Management Acceptance Committee, (GMAC) survey. The survey asked 900 companies nation-wide what types of employees they are seeking when evaluating potential college recruitment applicants. Virtually all companies indicated they are seeking employees who know how to conserve resources, reduce costs, and to overcome economic constraints.

B. Local Campus Green Efforts

a. Tulsa Community College

TCC has recently taken up the mantle of becoming more sustainable with the implementation of several key changes on all of their campus. The biggest was replacing all campus bins and implementing a single stream recycling program. Students walking around a campus will see bright blue and grey labeled bins alerting them of the institution's new commitment.



In addition, they have joined AASHE and formed a Sustainability Committee. Since the formation of the committee, the school held an educational "StayConference" which featured Dr. Cortese as a guest speaker and recently held a campus wide Sustainable Week that encompassed a variety of faculty and student activities.

b. NSU

Not to be outdone, Northeastern State University, (NSU) has also made it clear to students that sustainability is a top focus for the organization. Their website features the slogan, "Gather here & Go Green", and lists the entire sustainability strategic plan.



NSU has implemented a single stream campus recycling program, and has been a participant in the national Tree Campus program which promotes creating more green spaces on campus with the care and maintenance of specific plants and trees.

NSU has plans to raise funds to purchase and implement the STARS system.

c. TU

Potential University of Tulsa students will also be treated to some key changes on campus. The high caliber university has also moved to a single stream recycling program, eliminated the use of cafeteria trays, and participated in the national Recyclemania contest. The organization created its own unique logo and is also a member of both AASHE & STARS. They have also formed a sustainability committee and even created an on-site recycling center that allows students everywhere to participate in the schools' green efforts and have fun while doing it.



All of these support the research that sustainability and recycling are becoming increasingly important. Students are going to be more engaged and expecting these types of programs as they are coming from community colleges who are already creating a buzz for these types of practices. This stands to reason, if students are becoming exposed to these practices and efforts then they will wish to continue that participation whenever transferring or scouting out new potential universities.

II. START WITH BASICS

a. Getting Most from Recycling Program

A large amount of information on do's and don'ts of recycling can be found on the internet and will vary depending on the source. However; there are some basic principles that are dominant throughout all literature on recycling. The overall driving force is the convenience factor. The more effort a person has to expel to engage in recycling, the least chance of the behavior becoming permanent. This is exceedingly true for college students. With the constant demands of balancing work, school, and life, students need simplicity. According to a recent study published by the Princeton Review, 65% of students include green efforts such as recycling as part of their decision criteria when selecting a college. This supports all the data collected that conservation and green practices matter to students but convenience will take precedence. Therefore a successful campus recycling program should always have the following components,

1. Clearly Labeled bins for Multi-Stream Recycling - **INCLUDES** Trash
2. Adequate sized bins for high traffic areas such as commons areas, dining areas, and classrooms/ dorms
3. Educational Awareness Campaign
4. Findings Report

Many organizations tend to neglect trash when evaluating which streams to include in recycling effort but this a huge mistake. We have already stated that everything produces waste so students are going to need receptacles to dispose of their waste

even at the expense of recovery efforts. In other words, if bins are not clearly labeled for trash, paper, plastic, etc. even green conscious students will toss their trash into any nearby bin. Likewise, bins should be of adequate size to handle the traffic influx. Many campuses have multiple classes taking place in the same room throughout the day with an average of 30 + students in the room each class. For this reason, small personal sized bins will be ineffective as they will fill up quickly and then students will be forced to engage in counter-productive efforts by contaminating the recycling streams. Programs that do not factor this into consideration are inefficient and send a mixed message to students about the level of priority the institution places on sustainable efforts. Renowned environmentalist, Dr. Anthony Cortese, founded the national conservation organization, "Second Nature" to promote and assist schools with sustainable practices including implementation of a successful recycling Program. Since its inception in 2006, Dr. Cortese has been able to bring together schools across the nation to have crucial conversations regarding the importance of greener practices. The site offers a variety of resources such as webinars, video conferences, facts, figures, findings, and even a monthly newsletter. In a recent webinar on sustainability, Dr. Cortese conducted a poll with the attendees to illustrate a fundamental problem with current campus efforts. The poll consisted of just two questions, "Does your campus/organization engage in CSR practices," and "Does your campus/organization publish a CSR scorecard." Nearly 61% of the attendees reported campus engaging in greener practices but in contrast 71% (of those 61%) do not publish a report or share their findings with students/ faculty. After the poll was conducted he then shared national stats that supported the results from the webinar poll. Approximately only 17% of companies engaging in CSR/Sustainable practices actually publish the results of their efforts to the public/student body. Think about this for a moment. Imagine attending a class or signing up for a service, such as a health club and committing your time and energy to achieving a certain outcome. However; the instructor in the class grades you but never tells you the results. As a student would you want to continue to attend or participate in this type of class? Probably not. This is why it cannot be stated enough for campus's to share their efforts and results with all stake holders. This can help with buy in and lets

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everyone from the top down see that recovery efforts are a top priority for the school.

Sources:

www.nrc.com

www.secondnature.com

www.tulsacc.edu

www.nsu.edu

www.tu.com

III. OSU SUSTAINABILITY PROGRAM OVERVIEW

a. General University Energy Policy

OSU Energy Policy

Oklahoma State University Policy and Procedures

ENERGY MANAGEMENT	1-0520 GENERAL UNIVERSITY August 2007
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POLICY

1.01 The OSU/A&M Board of Regents embraces energy conservation and endorses the concept that it is everyone's responsibility to ensure every reasonable effort is made to conserve energy and natural resources while exercising sound financial management.

1.02 The importance of adopting an energy management and conservation policy is recognized in order to administer the program. The implementation of this policy will be the joint responsibility of the Board of Regents, campus administration, faculty, staff, students, and Energy Education, Inc. (EEI). Success is based on cooperation at all levels.

PROCEDURE

2.01 Each campus will maintain accurate records of energy consumption and cost and will provide verifiable performance information to the Board of Regents and administrations at the various institutions in the OSU System on the goals and progress of the energy conservation program.

2.02 Each campus administrator will be accountable for energy management on his/her campus, with energy audits being conducted and feedback provided by the Energy Educator/Managers.

2.03 To ensure the overall success of the energy management program, the following specific areas of emphasis will be adopted:

A. EEI will administer its energy conservation and management program, primarily through the campus Energy Education/Managers and administrators.

B. The Board expects all personnel at each campus to make a positive contribution to maximize energy conservation and produce real energy savings.

C. "Energy Guidelines" will be adopted that define the rules for implementation of the energy program.

2.04 To promote a safe, healthy learning environment and to complement the energy management program, each campus shall review and adhere to the preventive maintenance and monitoring plan administered by the campus physical plant for its facilities and systems, including HVAC, building envelope, and moisture management.

OSU Energy Policy Guidelines

Energy Guidelines

RESPONSIBILITIES

- Every person is expected to be an “energy saver” as well as an “energy consumer.”
- Faculty and staff members are responsible for implementing the guidelines during the time within their classrooms and respective offices.
- The custodian/cleaners are responsible for control of common areas, i.e. halls, cafeteria, etc.
- Since the custodian/house cleaners are typically the last persons to leave a building in the evening, they are responsible for verification of the nighttime shutdown.
- Selected campus building administrators are responsible for the total energy usage of their buildings.

- The Energy Educator/Managers perform routine audits of all facilities and communicate the audit results to appropriate personnel.
- The Energy Educator/Managers are responsible for suggesting adjustments to the campus Energy Management System (EMS), including temperature settings and run times for HVAC and other controlled equipment.
- The Energy Educator/Managers provide regular reports to building administrators indicating energy savings performance.
- Physical Plant Services is committed to and responsible for maintenance of the learning environment.
- **To promote a safe, healthy learning environment and to complement the energy management program, each campus shall review and adhere to the preventive maintenance and monitoring plan administered by the campus physical plant for its facilities and systems, including HVAC, building envelope, and moisture management.**

GENERAL

1. Classroom doors shall remain **closed** when HVAC is operating. Ensure doors between conditioned space and non-conditioned space remain closed at all times (i.e. between hallways and gym or pool area).
2. Proper and thorough utilization of data loggers will be initiated and maintained to monitor relative humidity, temperature, and light levels throughout the campus's buildings to ensure compliance with these guidelines.
3. Non-critical or non-essential exhaust fans should be turned **off** every day and during unoccupied hours.
4. All office machines (copy machines, laminating equipment, etc.) shall be switched **off** each night and during unoccupied times. Fax machines should remain on.
5. All computers should be turned **off** each night. This includes the monitor, local printer, and speakers. Network or sensitive equipment is excluded.
6. All capable PC's should be programmed for the "energy saver" mode using *the power management* feature. If network constraints restrict this for the PC, ensure the monitor "sleeps" after 10-minutes of inactivity.

AIR CONDITIONING EQUIPMENT

1. Occupied temperature settings shall *NOT be set below 74°F* unless that area is identified as a critical environment that requires cooling below 74°F.
2. The unoccupied time shall begin when the students, faculty or staff leave an area.

3. During unoccupied times, the air conditioning equipment shall be **off**. It is anticipated that the temperature of the classroom will be maintained long enough to afford comfort for the period faculty remains in the classroom after the students have left.
4. Air conditioning start times may be adjusted (depending on weather) to ensure student and faculty comfort when classes begin.
5. Ensure outside air dampers are closed during unoccupied times.
6. Ceiling fans should be operated in all areas that have them.
7. Relative humidity levels shall not exceed 60% for any 24 hour period.
8. Air conditioning should not be utilized in classrooms during the summer sessions unless the classrooms are being used for instruction or extracurricular activities. Air conditioning may be used by exception only or in those campus buildings that are involved in team-cleaning.
9. In all areas which have evaporative coolers such as shops, kitchens and gymnasiums, the doors leading to halls which have air conditioned classrooms or dining areas should be kept closed as much as possible.
10. Ensure dry food storage areas are maintained within code requirements. Typically, this is 55°F-75°F temperature and 35%-60% Relative Humidity. Utilize loggers to verify.

Cooling Season Occupied Set Points¹: 74°F - 78°F

Unoccupied Set Point: 85°F

Heating Season Occupied Set Points¹: 68°F - 72°F

Unoccupied Set Point: 55°F

¹ Set points are in accordance with ASHRAE 55 "Thermal Conditions for Human Occupancy"

HEATING EQUIPMENT

1. Occupied temperature settings shall NOT be above 72°F unless it is a critically controlled environment.
2. The unoccupied time shall begin when the students, faculty or staff leave an area.
3. The unoccupied temperature setting shall be 55°F (i.e. setback). This may be adjusted to a 60°F setting during extreme weather (With exception to some labs, animal areas...).
4. During the spring and fall when there is no threat of freezing, all steam and forced air heating systems should be switched off during unoccupied times unless required to maintain a sensitive environment. Hot water heating systems should be switched off using the appropriate loop pumps.
5. Ensure all domestic hot water systems are set no higher than 120°F or 140°F for cafeteria service (with dishwasher booster).
6. Ensure all domestic hot water re-circulating pumps are switched off during unoccupied times.
7. In applicable areas with heat pumps, ensure a 6°F dead-band between heating and cooling modes.

8. Heating oil and propane (if applicable) levels should be physically measured and recorded by “sticking the fuel tanks” or recording readings from propane tanks at least on the following intervals:
 - 1) recurring scheduled monthly date
 - 2) immediately before new delivery,
 - 3) immediately after delivery.

LIGHTING

1. All unnecessary lighting in unoccupied areas will be turned **off**. Faculty and students should make certain that lights are turned off when leaving an empty classroom. Utilize natural lighting where appropriate. “Lights off in unoccupied areas” is the theme to spread around campus.
2. All outside lighting shall be **off** during daylight hours unless required for a university sponsored event.
3. Gym lights should not be left on unless the gym is being utilized.
4. All lights will be turned **off** when students, faculty, and staff leave the area. Custodians will turn on lights only in the areas in which they are working.
5. Refrain from turning lights on unless definitely needed. Remember that lights not only consume electricity, but also give off heat that places an additional load on the air conditioning equipment and thereby increases the use of electricity necessary to cool the room.

WATER

1. Ensure all plumbing and/or intrusion (i.e. roof) leaks are reported and repaired immediately. If possible, grounds watering should only be done between 4am-10am.
2. Try not to water during the heat of the day, typically between 10am – 8pm.
3. When spray irrigating, ensure the water does not directly hit the building.
4. If possible, ensure water sub-meters are installed on irrigation and cooling tower supply lines to eliminate sewer charges.

Disclaimer: The University System shall adopt, observe and implement these guidelines as provided. However, these guidelines are not intended to be all-inclusive, and they may be modified for local conditions. These guidelines supersede all previous instructions related to energy conservation or building management.

b. OSU Tulsa Sustainability Program Overview

Mission/Goals

- 1) Embrace sustainability through instruction, research, outreach, and operations.
- 2) Sustainability is the triple bottom line: people, profit, and planet.
- 3) Energy Conservation Program

- 7/07 - 9/14 - \$3,178,000 and 26% in savings.
- System wide program
- Program is a behavior based program
- Cost avoidance means
- Top down support - Board of Regents, Presidents of each campus
- OSU adopted a policy as well as program guidelines, i.e. everyone is an energy user and an energy saver

4) Change Behavior

- Optimization - change behavior to become more efficient. Process optimization has immediate payback.
 - Temperature set points
 - Time of day schedule - dependent on individual building operational plans, requires continual coordination and verification, limited by space usage requirement
 - Holiday shutdown provides large gaps of time of no or low occupancy
 - Reduced plug load
- Education - change behaviors to create a culture of energy efficiency, which creates lasting savings.
 - If it's not being used, turn it off - lights chargers, computers, speakers, printers, equipment, etc.
 - Utilize any and every method to get word out about program, i.e. presentations, events, committees,

5) Recycling

- Paper - 1) even before starting OSU in Tulsa saved \$4,000 due to reduced solid waste pick up charges 2) began in 5/2010 3) we average 50 tons / year
- Cardboard - American waste
- Batteries - Call2Recycle
- Plastic & Aluminum - 1) began in 4/2011 2) average 1,000lbs / year 3) PepsiCo, Keep America Beautiful, Waste Management, and Show Inc. 4) funds PepsiCo's Entrepreneurship Boot camp for Veterans with Disabilities program

6) Housekeeping - CIMS (Clean Industry Management Standard) Green Building Certified in Sustainable Cleaning Practices.

Landscaping - operate a controlled irrigation system (includes nighttime scheduling to reduce evaporation and waste). Use mulch to reduce need for weed killer. Follow an integrated pest management system. Plant native choices.

7) Sustainability U - green office certification program

- Office practices - accept e-signatures, e-newsletters, utilize adobe, duplex printing, use Garamond
- Culture - provide new departmental employees with our stewardship of resources commitment, recognize colleagues who champion sustainability efforts, be open to ideas and input from colleagues who propose efforts to be good stewards of resources
- Energy - computers, electronics, lighting, space heaters, windows, doors
- Purchasing - purchase energy star, check other departments before buying, Swap Shop
- Events, meetings, & break rooms - utilize shared screens, provide agenda / notes electronically prior to meeting, have mugs/utensils available in break rooms, provide recycling receptacles in meeting spaces



C. Current Practices

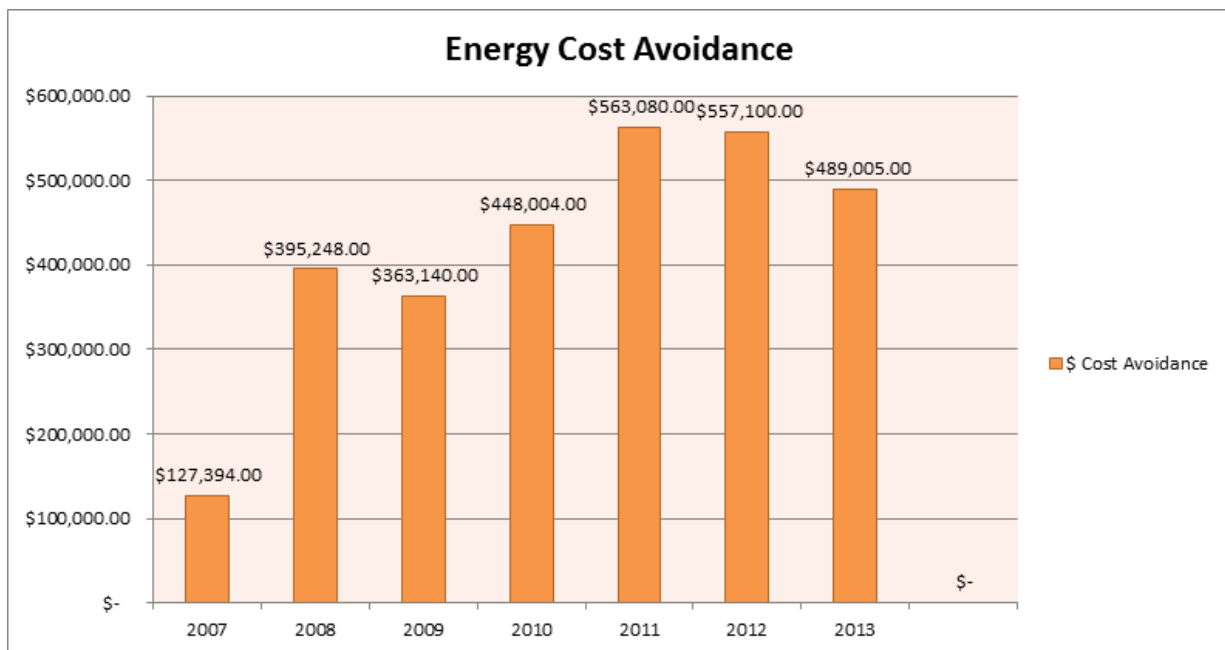
Many students are often surprised to hear the OSU Tulsa campus has a department for sustainability practices, so are likewise unaware of campus efforts. The OSU Tulsa sustainability Department is over the direct supervision of the department Director, Angelyn Holmes, and until recently was a one person operation. As of April, 2015, the department is taking applications for a part-time assistant to help further increase the campus sustainability efforts. Miss. Holmes has made tremendous accomplishments with moving the campus to greener efforts including starting a recycling program on campus, implementation of the Dream Machines, a faculty driven recycling program known as Sustainability U, and increasing efficiency with the current janitorial vendor, CIMS/ American Waste. The Go Green OSU Tulsa logo can be seen all over campus which is an excellent non-verbal cue to students that their campus cares about sustainability. However; the symbol represents much more than just a rally point. According to Angelyn, the Go Green logo was created to help promote an energy conservation program that was set

up through an outside agency back in 2007. The program is a behavior based program focused on reducing consumption.

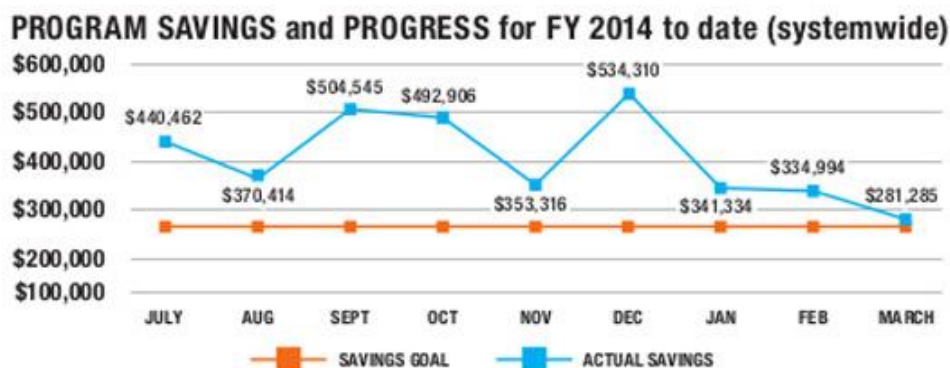
D. Costs Realized

The program's unique structure guaranteed the school they would not lose money as each year's savings would cover the yearly fee. At the conclusion of the 7 year period, the campus would continue to retain the efforts and benefits of the program but would no longer be paying anything. The program has been successful averaging a savings of \$30k monthly, or about 10% of the overall system wide savings as evidenced in the two figures below.

OSU in Tulsa Energy Program Cost Avoidance:



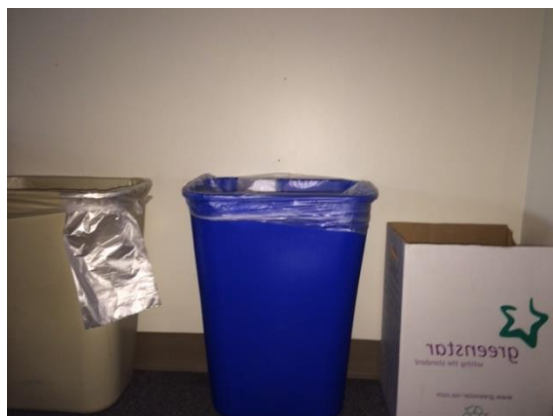
OSU System wide Savings goal vs. actual savings:



In accordance with expert opinions, OSU Tulsa is following advice for success by instituting a top down approach that includes a separate strategy/ program for faculty and students. To encourage faculty members to participate in recycling and other sustainable minded practices, there is an incentive based program known as Sustainability U. Miss. Holmes provides small cardboard containers to all faculty members to keep in their offices to recycle paper products. The janitorial staff collect these containers and take them to the large recycling receptacle as part of their daily chores. Since they will be collecting trash regardless, this causes them very little effort but yields big savings. Sustainability U themed emails are sent encouraging faculty members to submit their greener practice ideas, and is exploring possibility of offering a monthly or quarterly award for the most innovative and most effective idea. Again, this is an excellent way to get the buy-in of teachers long before they step into the actual classroom.

For students, the biggest milestone has been the successful implementation of the Pepsico Dream Machines. These machines are placed on campus by popular vending

machine areas in both Main & North Hall, respectively. The main machines contain screens that remind students to recycle their bottles and are conveniently located



near trash bins. In addition there are some larger bins, sans computer screen, scattered in walk-ways in both buildings such as the area by the Information Desk (North Hall) and the area outside the library (Main Hall). PepsiCo engages in an excellent display of CSR

behavior by providing these bins and machines at ZERO cost to OSU Tulsa.

Inside classrooms, the same cardboard boxes given to faculty are placed near trash cans for students to dispose of their paper products. Occasionally rooms may have a small 3 -7 gallon blue plastic tub near the cardboard box that may or may not be marked with the universal symbol of reduce, reuse, and recycle, (triple arrow). In theory, this simple system should work, but as the next few figures will illustrate, has room for improvement.

Sources

OSU Tulsa Sustainability Department w/ Angelyn Holmes



The first picture shows paper and cans in the waste bin with waste in the cans and bottles bin. The next figure in the diagram shows two waste bins, and nothing else; while the following picture shows a giant blue recycling bin... and nothing else. The last picture was taken in a high traffic commons area outside the library and shows only a waste bin visible. All of these pictures were taken after evening classes one day on campus in different random areas, but all show several commonalities.

The pictures show a lack of consistency and all are sending mixed messages. For example, one room has all three bins but students are not using for the purposes intended while other rooms have multiple duplicates of insufficient amount of bins in the room. With the exception

of the Green Star box, none of the cans have labels which only compounds the confusion.

E. Additional Considerations

Besides the obvious efficiency issue with the current system, there are also economical and financial gaps. As previously mentioned, American Waste takes all the campus waste to a single stream recycling plant at no additional charge. The problem with this is they are charging us for the total pounds of waste they collect, which we have the capabilities to recycle these items in-house. Another serious concern, is there is no quantifiable process for tracking the amounts we are recycling which causes the OSU Tulsa campus to miss out on using this as a recruitment tool.

As previously stated, a large majority of schools have recently modernized their recycling efforts on campus, so it is more important than ever for OSU Tulsa to do the same. OSU Tulsa is constantly battling to overcome the misguided perception of being a “real” school and having a comparable recycling program adds to the legitimacy of our institution even if students can not precisely articulate what is contributing to this perception.

IV. Comparing OSU Tulsa to OSU Stillwater

Not only are external competitors such as OU, NSU, & TU stepping up their conservation practices, but our internal competition of OSU Stillwater has also made several changes. The most notable ones are moving to a 90% wind-powered campus, and moving to single stream recycling in res halls, common areas, and classrooms. In addition, the Stillwater campus recently earned a Silver Star rating from the AASHE S.T.A.R.S. program, and was awarded a Green award from the E.P.A.

Stillwater has a sustainability committee and several recycling websites / social media, so it is abundantly clear to students that OSU “cares” and recycling is

important. What will our would-be students think when they see a clear separation of consistency between our two campus? For students who are seeking green campus, OSU Tulsa could be losing this opportunity to capture some potential revenue.

SOURCES:

www.osurecycles.com

<https://news.okstate.edu/articles/osu-recognized-green-efforts>

www.sustainability.okstate.edu

V. RECCOMENDATIONS

a. Shoring Up Recycling Gaps

To bring OSU Tulsa up to standard, it is highly suggested to implement the following.

1. Purchase 100 replacement recycling bins for all classrooms
2. Join A.A.S.H.E with paid membership
3. Form a student and faculty Sustainability Committee
4. Purchase top level of S.T.A.R.S. and register to earn a rating
5. Participate in Campus Sustainability Day in October
6. Participate in the 2016 “Recyclemania” Contest

Replacing the bins is a top priority as this is a clear signal to students. After researching various websites and other campus recycling resources, such as www.secondnature.com all clearly recommend a recycling program to have simplicity, consistency, and clearly labeled bins, so students know exactly what management wants them to do and how to do it.

b. Container Options

This paper has mentioned several times how our current bins are not clear, labeled, or consistent, so OSU Tulsa is losing valuable dollars in higher trash fees and potential revenue from green minded students.

After closely scrutinizing all the data, the main concern is the effectiveness of the classroom student program. Having Dream Machines in key traffic areas is an excellent place to start but ineffective practices in the actual classrooms (where the majority of the student body will be spending their time) is a missed opportunity to instantly increase success drivers. An average class will last for about three hours and most instructors generally give a 5 - 10 min break. During this time, many students will go to the restroom visit the campus café, vending machines, and often bring a small beverage / snack back to class. Once the student has consumed their beverage / snack they will then dispose of it inside the classroom as class is commencing and they will not want to leave class.

Earlier this paper gave some general statistics about an average number of students in a college class. This figure was using the OSU Tulsa campus specifically as a guide. According to the Sustainability Department there are approximately 100 classrooms on campus that hold classes from 4 - 10 pm. 30 students is probably an underrepresentation of the amount of per student capita, but for the purpose of this report shows how much of an impact with even such a small figure as this. Imagine that each classroom will see an estimated amount of 60 students each day, and of those 60, 50% will consume and dispose of 1 plastic soda bottle they obtained from the vending machine inside the classroom. This is saying about 50% of each class will consume 1 bottle every three hours.

Ask any college student and they will tell you this is being ultra conservative as the number is usually much higher than this and also includes sandwich wrappers, paper cups/ napkins from Subway as well as vending machine snacks. But again, for this simple model, assume we are just dealing with 60 plastic bottles a day per classroom. The current 3 -7 gallon sized tubs will not hold 60 plastic bottles, let alone any other waste products, so a standard occurrence is they will be dumped into the larger more prominent trash bins. If clearly identified larger bins were sitting right next to the trashcans, why wouldn't a student opt to toss the appropriate waste product into the bins? The answer - they wouldn't. Recall earlier the overarching principle of a successful student recycling program - convenience. Although the larger dream machine bins are just outside the hall, students are not going to walk all the back to the area they just left to deposit a plastic bottle no matter how eco savvy they may be.

Also, while it is commendable to encourage multi stream practices by placing the cardboard boxes for paper near the trash bins, most students ignore these or assume it is meant for trash. Why? They are small and often not marked. Even if the Sustainability department took enormous amounts of time to create and place signs on each little box in every classrooms, the chance of students using them is still very low. The boxes are so small that students will not notice signs low to the ground. It therefore stands to reason that the best practice would be to have prominent signs displayed on containers at eye level.

Again, trying to make signs and place them on all current small bins is still a waste of time and resources as we have already demonstrated the current containers are too small to handle the basic minimum amounts of student waste. The next obvious question then becomes, what should we be using instead?

Obtaining more free PepsiCo non computer based bins may seem like a great idea at first until you consider these are bulky, can take up a lot of space, and only address the issue of plastic bottles. So then would it be feasible to have a trash bin, small cardboard box that may or may not be labeled for paper products, AND a large blue clearly marked Dream Machine bin in each classroom??

Not only is this ineffective, it does not look visually appealing and can send a mixed message of sloppiness. No, the only choice is the classroom bins must be replaced, and this will involve a set up cost. After researching various companies on the web, the well-established company, Recycle Away seems to offer the best solution. They have been in business for many years and have such high end clients as universities, professional ball teams, and national parks. They have an entire line of containers specifically made for college campus classrooms.

The company offers an attractive rubber maid dual or triple stream 23 gallon bin complete with colorful signage for about \$376.99. They also have a dual stream 23 gallon set that sells for about \$244.76. While the two stream may seem like a better fit, it is highly recommended to go with the slightly more costly option for the triple

stream. This allows us to target all three current streams that are being focused on at OSU Tulsa, plastic, paper, and of course trash. Remember the experts stress not to overlook this needed component. Lid and Bin Color can be swapped out to help students clearly identify which bin is meant for which.



The larger size ensures each bin can handle the influx of trash from students on a daily basis and the durability ensures the bins will only need to be occasionally replaced due to normal wear and tear. On average, the bin will last a minimum of 7 years, possibly longer. The initial price tag to ensure all classrooms have these multi stream bins can be a bit daunting as approx. it will cost an upfront cost of \$37,616. (\$376.99 x 100 bins) but this number pales in consideration to the amount of potential income of just 4% in new student income. According to the main website and OSU bursar office, the average cost of tuition is approx. \$7442 and the campus has an average of 2000 students, so 4% would only be 80 students or a total \$227K. If this number seems unrealistic, consider the income of adding just 5 new students with the green efforts 5 students X 7442 = \$37,210.00. This means that it will only take 5 new students to offset the initial investment cost of installing the new bins. However; this

is not the only way to offset the cost. Recall that OSU Tulsa has been adding an average of \$30k monthly to the system wide bottom line for the past 3 years! With just reallocating 1.5 months of savings, administration can implement the entire program listed in the previous section and can recoup this small effort by the next month or within one semester with attracting as few as 5 new students.

Sources:

www.recyclemania.com

www.campusprimerrecycling.com

www.okstate.edu

C. Implementing STARS & AASHE

Although there are several free options, management is encouraged to purchase the paid membership versions in order to maximize all opportunities. One year membership in the AASHE program costs a reasonable \$1400 and will allow us to purchase STARS with the low rate of \$500. Normally this version costs \$1500, but all AASHE members receive a steep discount which makes this the most logical option. Don't forget several other schools/campuses have already paid their fees; including TCC & OSU Stillwater. For consistency, if OSU Stillwater is a paid member, so should OSU Tulsa. By extension, we should be actively working towards a Silver rating or

better since our main campus has earned a Silver, and only paid STARS members are allowed to attain ratings.



D. Campus Sustainability Day & Recyclemania

Participation in these nation-wide programs are simple and budget friendly.

Management needs only to sign up the campus on the two websites in question, and then communicate the efforts and goals to students and faculty alike. These are free programs, so can serve as great motivators to get the entire OSU Tulsa team excited about recycling and being green. The campus has several student organizations, so this is also an opportunity for administration and students to work together and continue to send a clear message that OSU Tulsa “cares’ too.