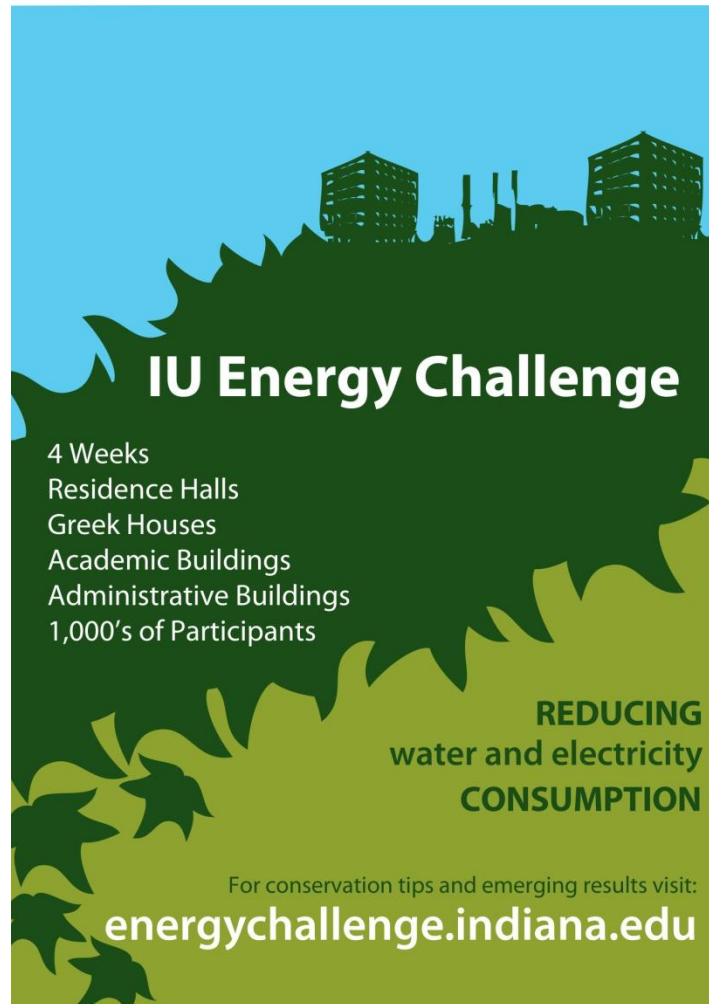


2010 Fall IU Energy Challenge



Indiana University Office of Sustainability
Mckenzie Beverage
Fall 2010

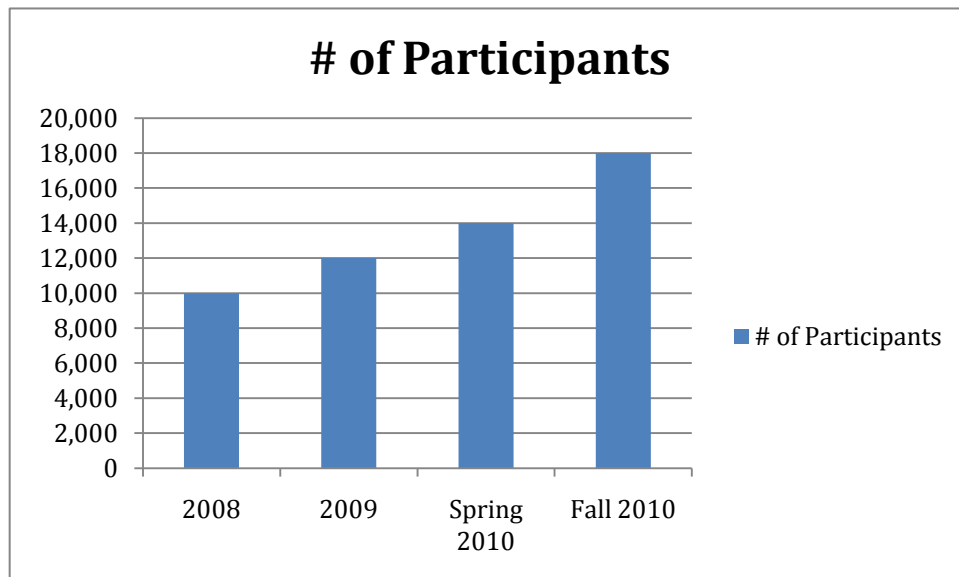
I. Introduction

According to the United States Environmental Protection Agency, 5.9 billion metric tons of CO₂ were emitted into the atmosphere in the United States in 2008. Of that total, 2.3 billion metric tons is being emitted into the atmosphere for electricity generation from burning fossil fuels (EPA, 2010). Energy efficiency alone is not enough to curb these emissions. Conservation is of paramount importance to achieve reductions of greenhouse gases that contribute to global climate change.

The IU Energy Challenge is an annual competition to conserve energy and water at Indiana University. The purpose of the challenge is to educate participants about the significant impacts behavioral changes have on conservation. The Energy Challenge is an opportunity to learn-by-doing, a powerful educational tool. Savings are reported weekly which gives participants tangible results throughout the four weeks of the challenge.

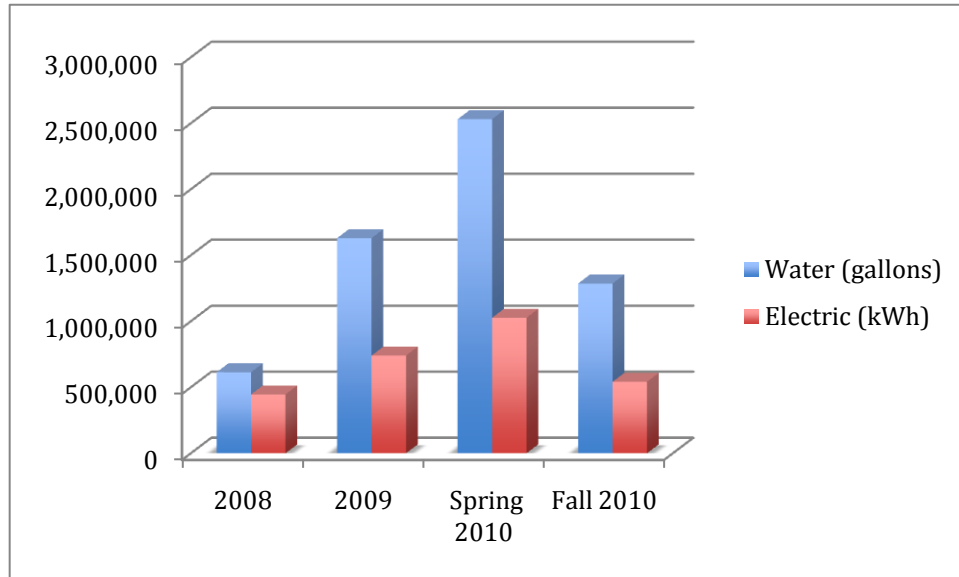
The competition began in the spring of 2008 in ten residence halls. Each year more participants have been added. In 2009, eighteen Greek houses joined the competition. In the spring of 2010, eight more Greek houses were added and eight academic buildings. Twelve additional academic and administrative buildings were included in the first-ever fall competition which took place October 6 – November 3, 2010. Nearly forty percent of buildings on campus are now participating in the challenge. Buildings are chosen based on the availability of historical consumption data and the presence of a meter. Table 1 shows the increase in the number of participants over time.

Table 1



In total, the residence halls, Greek houses, academic, and administrative buildings have saved 2,753,850 kilowatt hours of electricity and 6,061,365 gallons of water as a result of the four competitions*. This is enough energy to power over 2,753 average American homes for four months and enough water to fill more than ten Olympic sized swimming pools. An estimated 4,392,252 pounds of CO₂ emissions and \$199,469 in utility costs were avoided as a result of these efforts. Table 2 shows the fluctuation in savings over time.

Table 2



Given the bigger picture, the Energy Challenge savings seem like a very small portion of the whole. In terms of tonnage, the Energy Challenge diverted 1,993 metric tons from being emitted into the atmosphere over the sixteen-week period. Considering nearly 1,968 million metric tons are emitted into the atmosphere in the United States in that same period of time, the savings from the Energy Challenge make a small dent in that number. Nonetheless it should be noted that these savings were achieved by 18,000 people through simple behavioral changes.

II. History

The pilot 2010 Fall competition was the first competition to take place in the fall. Savings decreased for the first time throughout the history of the challenge. This is likely due to a lack of awareness. Savings for the Fall Energy Challenge resulted in 541,206 kWh of electricity and 1,286,199 gallons of water. The Spring 2010 Energy Challenge saw a savings of 1,026,319 kWh and 2,530,959 gallons of water.

* The presentation was given prior to the end of the Fall Energy Challenge so these results were not yet available. Information presented in the associate powerpoint will be incongruent with results presented in this paper.

The 2009 Energy Challenge resulted in a total savings of 740,186 kilowatt hours of electricity and 1,630,288 gallons of water among the 10 residence halls and 18 Greek houses. The electricity savings were 59% greater than the 2008 competition and the water savings were 83% greater. This resulted in an estimated savings of 1,151,729 pounds of avoided CO₂ emissions and \$47,000 in avoided utility costs. Teter Quad was the first place winner for the residence halls and Sigma Alpha Mu won among the Greek houses. Teter was awarded two “hydration stations” to fill up reusable water bottles with filtered water along with a cookout. Sigma Alpha Mu was awarded a \$900 cash prize.

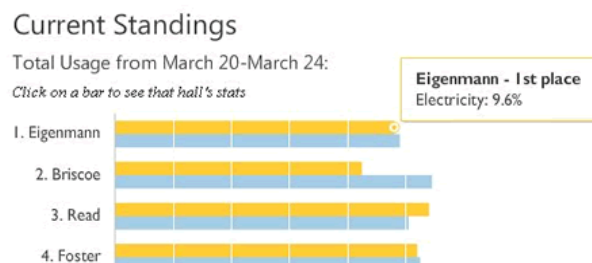
The 2008 Energy Challenge consisted of 10 residence halls. The Greek houses did not participate in 2008. Overall, the participating dorms saved 446,139 kilowatt hours of electricity and 613,919 gallons of water compared to their three-year baseline. These conservation efforts attributed to an estimated cost savings of \$26,000.

Increased outreach efforts heightened awareness of the 2009 Energy Challenge. The former Indiana University Task Force on Campus Sustainability, now Office of Sustainability, created an academic year internship for the 2009 competition. This assignment of an Energy Challenge coordinator greatly increased the success of the competition. I was hired to serve as the 2009 Energy Challenge Coordinator and returned again to organize the 2010 competition.

The Energy Challenge developed out of an Informatics Masters Capstone project. David Roedl, a student in Human Computer Interaction Design in the School of Informatics, developed an interactive website similar to Oberlin College’s Resource Monitoring System* to showcase each residence hall’s consumption. The website, energychallenge.indiana.edu, allows users to see how much energy and water their building is consuming compared to their competitors. Roedl’s website was the catalyst for the Energy Challenge that lasted from March 20 – April 17, 2008.

Figure 1 is a snapshot of the standings bar graph from the website Roedl created.

Figure 1



* See Oberlin’s Dashboard at <http://www.oberlin.edu/dormenergy/>

The interactive website displays the rankings of each participating residence hall and Greek house. The amount of water and electricity is displayed as a percentage of the one-month baseline (Pierce, 2008). In addition to displaying standings, the website offers tips for conservation and useful links such as ecological footprint calculators and phantom load charts. The official rules of the challenge are also displayed.

This Masters Capstone Project secured David Roedl a spot at the 2008 Microsoft Imagine Cup Interface Design Competition in Paris, France. The competition allots 24 hours for contestants to work through a website design problem and prepare a presentation. Although Roedl and his teammate, Will Odom, were late due to a delayed flight, they won first place (Roedl, 2008).

III. Methods

The Energy Challenge is hosted by the Office of Sustainability, formerly known as the Task Force on Campus Sustainability. Other collaborators include Residential Programs and Services, Physical Plant Utilities, Residence Halls Association, Duke Energy, City of Bloomington Utilities, Greeks Go Green, and Building Services. These collaborators aided in everything from collecting and analyzing consumption data, informing and educating students about the challenge and conservation measures, organizing outreach efforts, and planning events.

The 2010 Fall Energy Challenge was a pilot project so funding was not requested for a prize. Three trophies were made from salvaged meters and other metal materials from a metals dumpster on campus. The Service Building donated in-kind services to weld the materials together. A picture of the trophy can be viewed on the website (energychallenge.indiana.edu).

The 2010 Spring Energy Challenge was made financially possible by the Office of Sustainability, Office of the Provost, Office of the Vice President for Capital Projects and Facilities, Residential Programs and Services, Residence Halls Association, Physical Plant Utilities, and TRANE Corporation. These contributors provided financing for the residence hall prize and cookout, poster printing and laminating, and the winner announcement reception. The Greek houses contributed \$50 per house to raise the funds for their prize. Greeks Go Green officiated the fundraising for the Greek houses and managed the funds until the end of the challenge.

In total, the Energy Challenge sponsors contributed \$6,300 to this effort. These funds paid for Collins' celebratory cookout and their energy conservation prize, motion sensor retrofits for the lights in the building. The Greek houses raised \$1,250, which was divided into first and second place cash prizes of \$900 and \$350 respectively. The academic buildings will have a traveling trophy made from an old university electric meter that will be housed in the winning building each year.

1. Data Collection and Analysis

During the challenge, the residence hall meters were read semi-weekly while the Greek and academic building meters were read once weekly. Glenn Moulton from the IU Physical Plant Utilities has been the sole meter reader for the last three competitions. The readings are then entered into a spreadsheet to determine usage based on their three-year consumption rates, or baselines. Electricity consumption is given twice the 'weight' as water usage because of the increased carbon emissions associated with electric usage.

A baseline is the average of three years of energy usage for the weeks of the challenge for each building. This baseline is static in order to reflect the percentage of improvement as the competition moves from one year to the next. For example, a residence hall's metered energy usage for the four weeks of the Energy Challenge (March 25 – April 22) from the years 2005, 2006, and 2007 was averaged to determine its baseline. Each residence hall competed against this static number in 2008, 2009, and 2010 and will continue to compete against this number each year. The baselines for the residence halls were calculated in 2008 from information in the Physical Plant electricity consumption archives. The academic building baselines were calculated by Rachel Weeks and Alex Rekkas, IU Office of Sustainability's Utilities Conservation Interns. The Greek houses are not typically metered by IU Physical Plant so their consumption archives had to be retrieved from Duke Energy. The City of Bloomington Utilities Department provided water usage data for all three factions of the challenge.

2. Awareness and Outreach

Participant awareness is vital to the success of the Energy Challenge. Nearly 18,000 students, faculty, and staff participated in the 2010 Fall IU Energy Challenge. Reaching this mass amount of people requires a great amount of coordination and outreach efforts through various forms of media. At least six months of planning time should be allotted for this effort. Each faction of the Energy Challenge requires a varied form of outreach.

i. Energy Challenge Website

The Energy Challenge website (energychallenge.indiana.edu) was completely revamped for the 2010 competitions. The website allows users to access their standings, current usage, and tips for conservation. It is an important component for spreading awareness about the competition, how the competition works, the rules of the competition, and displaying each building's standings.

ii. Poster Advertisements

For all competitions, large and small posters similar to the image on the cover page were printed for every building. This year the posters were printed without dates and laminated so that they can be used every year. Dates will be printed separately and affixed to the posters in the case that the dates of the competition change in the future. Additionally, flyers with slogans such as 'Take Back the Stairs' were printed and posted throughout the buildings. Figures 2 and 3 are examples of these flyers.

Figure 2

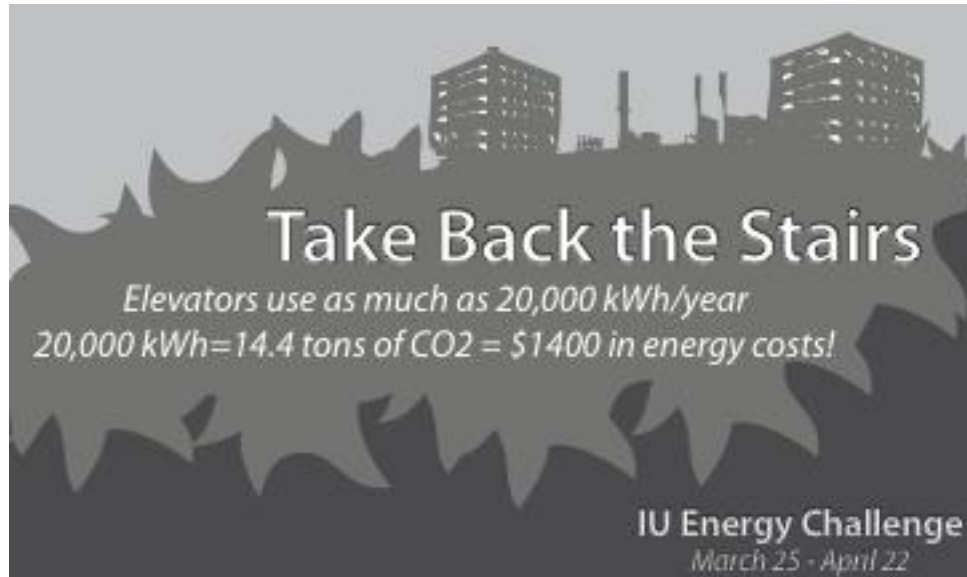


Figure 3



iii. Information Panels

Digital images of the Energy Challenge poster were displayed throughout the Indiana Memorial Union (IMU) and every residence hall. The residence halls voluntarily displayed this information, however the IMU must charge an advertisement fee which was deducted from the Energy Challenge advertising budget.

iv. Informational meetings and emails

Keeping building managers and staff abreast of the Energy Challenge is vital to the implementation of the Energy Challenge in programming events that happen in each

building. Awareness of the Energy Challenge grows each year among participants; however, keeping the building manager informed is a top priority. Creating listservs is a very simple way to contact each group involved. Residents' email addresses are not disclosed so email is not a reliable source of disseminating information. Information is included in weekly *InTouch* emails that are sent to every student in the residence halls.

v. Multi-media

It is difficult to predict which media form will have the biggest impact on its target audience. Although there are many forms of media to choose from, it is important to keep participants informed of their standing to foster competition.

a. Web 2.0

The Energy Challenge website received semi-weekly updates. To keep participants more engaged, the Energy Challenge also posted the updates on Twitter and Facebook. Energy Challenge related events, standings, pictures, personal experiences, etc. were the main content for the Energy Challenge Facebook Fan Page. The Energy Challenge Twitter account only posted standing updates.

b. IUSTV

IU Student Television is a student-run broadcasting network that airs in the residence halls and other buildings on campus. IUSTV ran a story about the Energy Challenge.

c. Print Media

The *Herald Times* and the *Indiana Daily Student* are the two local newspapers in Bloomington. The Energy Challenge was featured in these publications several times. Coverage in the newspaper contributed to awareness in the student body outside of the competition, as well as awareness among Bloomington residents.

d. YouTube

In 2009, Leila Marsh, an IU Telecommunications student, filmed, directed and produced an eight and a half minute documentary on the IU Energy Challenge for her final project. This documentary interviews the 'behind-the-scenes' people that make the Energy Challenge possible. The documentary also provides a thorough description of the challenge, how it works, and tips for conserving water and electricity in the dorms and Greek houses. The video is posted on YouTube for public viewing.

e. Press Releases

Press releases are the gateway to outside media outlets. A press release was written at the beginning, middle, and end of the Energy Challenge. Press releases can be found on the IU News Room website or on the Energy Challenge website.

vi. Student Outreach

Student involvement is a helpful tool for spreading awareness. Students communicate with their peers more readily than they see a flyer on a bulletin or notice an article in the student newspaper. Attempts were made this year to recruit students from every floor of

each residence hall to serve as Eco-Reps, but there was not a high volume of response. The intent of having Eco-Reps is to have students 'on the ground' that will communicate between the coordinator and their peers regularly. This alleviates the pressure from the RAs and RPS staff to communicate everything from The Office of Sustainability to the students.

IV. Concluding Remarks

The Energy Challenge is a powerful educational tool that focuses on experiential learning. We live in a society that is not set up to foster sustainable living. The Energy Challenge is a perfect way to prove that individual action does make a difference. Collected individual actions strengthen the sense of community and eventually result in collective action. Collective action is what drives this competition and contributes to its continued success.

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