

Utilities Conservation Final Report

Summer 2014, Academic Year 2014-2015

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1 BRIEF SUMMARY OF WORK

Summer 2014

I started off the summer by reviewing past Energy Challenges and the work of previous interns. In addition, I spent time learning about sustainability programs at several other universities in the Big 10 and especially paid attention to other conservation competition to see if there was anything that could be added to the Energy Challenge.

Around March 2014, John Kolditz approached IUOS with a proposal for collaboration between our office and IUOS for the Energy Challenge. After several tele-meetings I began working on the content for a new gaming app that would later be known as the IU Eco-App, as well as designing how the game would be played.

In June I joined forces with Coal-Free IU to build a proposal to receive funding from Duke Energy to help support the Energy Challenge. Since the request would be coming from a student group and not an IU office, I had prepared a large, several thousand dollar proposal. However, shortly before we were to approach Duke Energy for a meeting, Coal-Free IU was suddenly no longer able to work with us. Since now any proposal would have to come from IUOS, I reworked the request for a much smaller amount and contacted Duke via Erica Steinfeldt's contact in the company. After a meeting, the company donated \$500 for the Energy Challenge.

In addition to the corporate donation, I was able to obtain over \$400 in gift card donations from local businesses. These cards were later used as prizes for the Eco-App.

I met with the building managers of almost all the buildings participating in the Energy Challenge and took notes on building issues. For many of these issues, I advised the managers to lodge service requests from the Physical Plant.

Other work during the summer involved planning the first IU Power Hour event, which was an Energy Challenge promotional event. I also helped with the IUOS table at the RPS Staff fair and the table at the Taste of the Union event.

Academic Year 2014-2015

During Fall 2014 I completed the content of the IU Eco-App and designed how the game would work. Promotion for the game took the form of social media posts, flyers, posters, tabling, and emails to

building managers. In addition, I worked with First-Year Experience intern Cleo Hernandez to host a Sustainability Workshop at Collins Living-Learning Center.

Power Hour took place two weeks before the Fall 2014 Energy Challenge. I organized the event, prepared materials, and recruited volunteers to assist. Other Energy Challenge events that semester included the Energy Challenge Breakfast, the Greek Energy Challenge Pizza Party, and the Energy Challenge Awards.

For the Spring 2015 semester I designed new content for the IU Eco-App. However, at this point Intelen was facing some internal issues, and IUOS decided to go in a different direction. So, I created the #iuenergychallenge social media contest.

During this semester I worked with Cleo Hernandez and Sustainability Peer Educator Program coordinator Dana Schroeder on another workshop, this time at the Hutton Honors College and another, larger Power Hour event.

Other events held this semester included the Energy Challenge Breakfast and the Energy Challenge Awards. Instead of having a stand-alone Greek Energy Challenge Pizza Party, we incorporated our standard Greek workshop and information distribution into the Greek Sustainability Nights held for the entire Greek community.

The above is a brief summary of my work this year. Many of the topics mentioned are detailed below.

2 IU ECO-APP

The IU Eco-App is a gaming app based on learning about energy conservation. In order to play, participants earn points by reading tips, taking quizzes, committing to perform simple sustainable actions, and entering Energy Matters High Energy usage updated. Players can redeem points for free gift cards!

Gameplay instructions are as follows:

How it Works: Content

- 1) Content is released every day Monday-Friday throughout the Energy Challenge. Players can access the game and play current content seven days a week during the duration of the contest.
- 2) Three tips will be released every day (Monday-Friday). These tips can be definitions of energy conservation terms, facts and statistics regarding energy conservation, or ways participants can help reduce their electricity and water usage.
- 3) One 5-question quiz will be released every Tuesday and Thursday. These quizzes are designed to be simple and are based off the information provided in the tips.

4) One commitment will be released every Monday, Wednesday, and Friday. These commitments are for simple sustainable action that every student can easily do. These include taking the stairs instead of the elevator, turning off the water while brushing their teeth, etc.

5) One Energy Matters High Usage Update is available every day (Monday-Friday)

Content is as follows:

Intelen Content

- Monday, Oct. 13th
 - Tips
 - Tip #1: Peak Demand is the highest capacity for electricity required in a certain period and usually takes place between 11:00 AM-5:00 PM Electricity is over 300 times more expensive at peak demand than normal, so try to reduce energy use during this time.
 - Tip #2: A clothes dryer uses about 2.5 kWh per load. Each year, that's equal to 80 gallons of gas! Air dry your clothes on a drying rack or combine loads to reduce energy use and help your wallet!
 - Tip #3: Check out the Energy Matters app (part of IU Mobile) to see how much energy is being used on campus at any given time.

- Tuesday, Oct 14th
 - Tips
 - Tip #1: Phantom energy is the electricity that electronics use when plugged in, even if the device is off! Unplug unused items to save energy.
 - Tip #2: A washing machine uses a third of a kWh per load. That's equal to 10 gallons of gas a year! Try to only wash full loads of laundry, and use cold water instead of hot when possible.
 - Tip #3: We're on Facebook! Check out the IU Energy Challenge page for great information throughout the year and the chance to win prizes!

- Wednesday, Oct 15th
 - Tips
 - Tip #1: A kilowatt hour, or kWh, is the unit in which electricity is measured by most utilities.
 - Tip #2: A TV can use up to a third of a kW per hour. That's equal to 39 gallons of gas each year! Turn off the tube and go hang out with your friends!
 - Tip #3: Follow the Energy Challenge on Twitter @HoosierEC to get all the latest energy savings news throughout the year and to win great prizes!

- Thursday, Oct 16th
 - Tips

- Tip #1: Did you know? Bottled water can cost up to 300 times more than tap water.
 - Tip #2: It's easy to drink tap water on campus. Carry a reusable water bottle in your backpack and fill it up at the many water fountains and water bottle refill stations around campus!
 - Tip #3: While the plastic water bottles are recyclable, the vast majority are not- only 15% were recycled in 2004.

- Friday, Oct 17th
 - Tips
 - Check it out! There are tons of great sustainability programs on campus. For example, the Green Room Certification Program (GRCP) is an easy way to go green AND help your dorm win the Energy Challenge.
 - During the 2013-2014 Academic Year, 525 dorm rooms on campus became Green Room Certified. Find out how you can, too, at <http://sustain.indiana.edu/programs/green-room-certification-program/about-the-program.php>
 - Getting Green Room Certified is easy! Certification is done online and you earn a free water bottle!

- Monday, Oct 20th
 - Tips
 - Tip #1: Cell phone chargers use .4 kW per hour. To conserve energy, unplug your charger when not in use, and don't leave your phone charging overnight!
 - Tip #2: Laptops use .05 kW per hour. That's equivalent to 6 gallons of gas a year! Power down your laptop or set it to sleep when not in use.
 - Tip #3: Want to get involved? Check out the IU Office of Sustainability's web site at sustain.indiana.edu for news on upcoming activities and events.

- Tuesday, Oct 21st
 - Tips
 - Tip #1: Did you know? Producing bottled water is a huge waste of water, oil, and energy. It takes three liters of water to produce one liter of bottled water. Be a part of the solution- drink tap water out of a reusable water bottle.
 - Tip #2: Producing bottled water also emits large amounts of pollution. In 2006 alone, over 2.5 million tons of carbon dioxide were released from bottling water.
 - Tip #3: Every year, more than \$100 billion (US) is spent on bottled water all over the world. Think of how many burritos could be bought with that much money! (Hint: Over 140 million)

- Wednesday, Oct 22nd
 - Tips

- Tip #1: If every student on campus took the stairs once a day instead of the elevator, we would save 18,000 kWh of energy a month. That's 72,000 kWh a semester!
 - Tip #2: Did you know? Screen savers actually consume more energy than using your computer and can reduce its life. Set your computer to go to sleep or power it down when not in use.
 - Tip #3: 90% of the energy used by a washing machine goes to heat the hot water. Wash your clothes in cold water for instant energy savings!

- Thursday, Oct 23^d
 - Tips
 - Tip #1: Water is wasted when the toilet is flushed unnecessarily. Do not use the toilet as a trash can!
 - Tip #2: Use light only where you need it. Try using a desk lamp instead of overhead lights.
 - Tip #3: Air dry your hair instead of using a blow dryer to cut more than two hours' worth of energy use every week.

- Friday, Oct. 24th
 - Tips
 - Tip #1: Need a bike? Crimson Cruisers is a bike library program here at IU. To apply to borrow a bike for free, check out the website at <http://sustain.indiana.edu/programs/bicycle-initiative/index.php>.
 - Tip #2: Parking a car at IU is a huge hassle. Avoid the headache by biking to your destination.
 - Tip #3: Bike parking is conveniently located around campus. Some locations include Ballantine Hall, Franklin Hall, HPER building, Jordan Hall, Psychology, SRSC, Sycamore Hall, Education Building, Geology, IMU, Wells Library, School of Music, SPEA, Woodburn, and many other buildings around IU!

- Monday, Oct 27th
 - Tips
 - Tip #1: If you are taking a lab class this semester, make sure to close the fume hood sash when not in use. If left open, a fume hood can use 3.5 times the energy of a house.
 - Tip #2: Take shorter showers. It takes 129 watts per gallon to heat water, so reducing your shower time by one minute will save 1,355 watts. That's enough energy to charge an iPhone 249 times.
 - Tip #3: Turn off the water when shaving in the shower, soaping up, and washing your hair. It's an easy way to save water!

- Tuesday, Oct 28th
 - Tips

- Tip #1: Did you know that producing bottles for bottled water in the US uses the equivalent of more than 17 million barrels of oil? (not including transportation) Do your part to reduce this number by drinking tap water out of a reusable water bottle!
 - Tip #2: In 2005, more than 50 million plastic bottles were made from virgin (rather than recycled) plastic. This contributes to increased greenhouse gas emissions.
 - Tip #3: Tap water can even be healthier and safer than bottled water! Regulations for bottled water are more relaxed than those for tap water.

- Wednesday, Oct 29th
 - Tips
 - Tip #1: Did you know? About 1/3 of all lighting in the US is wasted. Flip off the switch when you leave the room!
 - Tip #2: Light bulbs use up to 60 watts of electricity per hour. Open the blinds and use natural light when possible!
 - Tip #3: Did you know? About \$2 billion/year is spent on wasted lighting. Don't leave lights on in empty rooms!

- Thursday, Oct. 30th
 - Tips
 - Tip #1: Turn off the water when brushing your teeth to save 4 gallons/minute- almost 50 gallons/week!
 - Tip #2: When doing laundry, match the water level to the size of the load- fewer clothes don't need as much water to get clean.
 - Tip #3: Report leaks! One slow drip can waste 20 gallons of water a day. Call the Leak Line at 855-3740 or let your RA/building representative know.

- Friday, Oct. 31st
 - Tips
 - Tip #1: Interested in gardening? The IU Campus Garden at Hilltop Garden may be exactly what you are looking for! Check out the website at <http://sustain.indiana.edu/programs/campus-garden-initiative/index.php>
 - Tip #2: Volunteer workdays at the IU Campus Garden at Hilltop Garden take place on Mondays from 6-8 and Thursdays from 5-7 throughout the entire school year (even November and December). Gloves and tools will be provided.
 - Tip #3: Produce from the garden can be taken home by anyone who volunteers!

- Monday, Nov 3rd
 - Tips
 - Tip #1: Did you know? In the US, 20% of energy use is residential. Our country is the 7th highest per capita user of residential energy.

- Tip #2: Did you know? The majority of energy is used to power cars and heat and cool homes.
 - Tip #3: A typical video game system uses about .2 kilowatts/hour. That's equal to 11 gallons of gas each year! Try limiting use, especially between 11:00 AM and 5:00 PM.

- Tuesday, Nov 4th
 - Tips
 - Tip #1: A box AC/heating unit can use up to 24 kWh a day. That's equal to 60 gallons of gas each year! Set the thermostat to 68 degrees in the winter and 78 degrees in the summer to conserve energy.
 - Tip #2: Did you know? Wasted lighting uses 30 million barrels of oil each year. Turn off the light when you leave the room!
 - Tip #3: Focus light where you are using it (i.e. use a desk lamp) instead of lighting an entire room.

- Wednesday, Nov 5th
 - Tips
 - Tip #1: Drinking the recommended eight glasses of water each day of tap water costs \$.49 per year. The equivalent amount of bottled water is \$1400 per year.
 - Tip #2: Don't like the taste of your tap water? Try filtering it through a filtered water pitcher.
 - Tip #3: Each year, 2.7 million tons of plastic is used to bottle water. Help stop the waste! Drink tap water out of reusable water bottles!

- Thursday, Nov 6th
 - Tips
 - Tip #1: Interested in helping IU become a more sustainable university? Check out the Student Sustainability Council at <http://www.indiana.edu/~iubssc/>
 - Tip #2: The Student Sustainability Council promotes sustainability on the IUB campus by working with representatives from many student organizations, from undergraduate student groups and graduate student groups to student governments.
 - Tip #3: Both individuals and extant student groups are eligible to join the Student Sustainability Council! Find out how you can get involved here: http://www.indiana.edu/~iubssc/get_involved/index.php

- Friday, Nov 7th
 - Tips
 - Tip #1: Review Time! Peak Demand is the highest capacity for electricity required in a certain period and usually takes place between 11:00 AM-5:00 PM Electricity is over 300

times more expensive at peak demand than normal, so try to reduce energy use during this time.

- Tip #2: Review Time! Phantom energy is the electricity that electronics use when plugged in, even if the device is off! Unplug all unused items to save energy.
- Tip #3: Review Time! A kilowatt hour, or kWh, is the unit in which electricity is measured by most utilities.

Intelen Quizzes/Commitments

Commitments

- Monday, Oct 13th
 - Commitment: I will check this app every day to read more tips on how I can save energy easily.
- Wednesday, Oct 15th
 - Commitment: I will avoid doing laundry during the hours of 11:00 AM and 5:00 PM in order to not contribute to peak demand.
- Friday, Oct 17th
 - Commitment: I will unplug electronic devices when not in use to avoid phantom load.
- Monday, Oct 20th
 - Commitment: I will not drink bottled water. Instead, I will carry a reusable water bottle and refill it from drinking fountains and hydration stations.
- Wednesday, Oct 22nd
 - Commitment: I will not leave my cell phone charging overnight to help save energy.
- Friday, Oct 24th
 - Commitment: I will take the stairs instead of the elevator at least once a day to do my part to conserve energy.
- Monday, Oct 27th
 - Commitment: I will wash my clothes in cold water whenever possible to save up to 90% of energy used by a washing machine.
- Wednesday, Oct. 29th
 - Commitment: I will turn off unused lights to avoid wasting electricity.
- Friday, Oct 31st
 - Commitment: I will have a fun and safe Halloween!
- Monday, Nov 3rd
 - Commitment: I will turn off the water when brushing my teeth to avoid wasting 4 gallons of water/minute.
- Wednesday, Nov 5th
 - Commitment: I will set my thermostat to 68 degrees in the winter and 78 degrees in the summer.
- Friday, Nov. 7th

- Commitment: I will report any leaks by calling the Leak Line at 855-3740 or by alerting my RA/building representative.
- Monday, Nov. 10th
 - Commitment: I will continue practicing sustainable behaviors throughout the entire year- not just during the Energy Challenge.

Intelen Quizzes

- Tuesday, Oct 14th (Baseline Quiz)
 - #1: What is Peak Demand?
 - A) a song by the Beatles
 - B) another name for a carbon footprint
 - C) how much energy and individual uses
 - D) the highest capacity for electricity required in a certain period
 - #2: What is phantom energy?
 - A) the amount of energy saved by switching from an energy inefficient device to a more efficient one
 - B) The electricity that electronics use when plugged in, even if the device is turned off
 - C) The amount of electricity saved by not using an electronic device
 - D) a horror movie
 - #3: What is a kilowatt hour?
 - A) unit for measuring time
 - B) a fancy watch
 - C) unit for measuring water consumption
 - D) unit in which electricity is measured by most utilities
 - #4 Do electronic devices use energy when plugged in, even if they are turned off?
 - A) Yes
 - B) No
 - #5 Does drinking bottled water have a negative impact on the environment?
 - A) Yes
 - B) No
 - Answers
 - D, B, D, A, A
- Thursday, Oct 16th
 - #1: At what time does Peak Demand usually take place?
 - A) 9:00 AM- 2:00 PM
 - B) 11:00 AM-5:00 PM
 - C) 10:00 AM- 7:00 PM
 - D) quiet hours
 - #2: What is the abbreviation for a kilowatt hour?

- A) kwh-h
 - B) kiwh
 - C)kWh
 - D) lbs
 - #3: Is it much more energy efficient to do laundry during Peak Demand?
 - A) Yes
 - B) No
 - #4) How much more expensive is electricity during Peak Demand?
 - A) 1000 times
 - B) 300 times
 - C) Electricity is cheaper during Peak Demand
 - D) 5 times
 - #5) Only 15% of recyclable plastic water bottles are actually recycled.
 - A) True
 - B) False
 - Answers
 - B, C, A, B, A
- Tuesday, Oct 21st
 - #1) How much does bottled water cost relative to tap water?
 - A) About the same
 - B)300 times more
 - C) Bottled water is actually cheaper
 - D) I'm too cheap to buy bottled water
 - #2) Anyone can see how much energy is being used on campus at any time via the IU Mobile Energy Matters app.
 - A) True
 - B) False
 - #3) Leaving a cell phone charging overnight wastes electricity
 - A) True
 - B) False
 - #4) During the 2013-2014 Academic Year, how many dorm rooms became Green Room Certified?
 - A) 100
 - B) 800
 - C) 525
 - D) 10
 - #5) You can get great tips and information about the Energy Challenge all year long by following them on Facebook and Twitter.
 - A) True
 - B) False
 - Answers

- B, A, A, C, A

- Thursday, Oct 23rd

- #1) Screen savers actually consume more energy than using the computer
 - A) True
 - B) False
- #2) Most of the energy used by a washing machine goes to heating hot water
 - A) True
 - B) False
 - C) I don't do laundry
- #3) Flushing the toilet unnecessarily wastes water
 - A) True
 - B) False
- #4) In 2006, how many tons of carbon dioxide were released due to the bottled water industry?
 - A) 1 million
 - B) 2.5 million
 - C) 5 million
 - D) I never realized that bottled water had such a negative effect on the environment
- #5) The cumulative effect of many individuals taking the stairs instead of the elevator, even just once a day, can have a significant effect on energy savings.
 - A) True
 - B) False
- Answers
 - A, A, A, B, A

- Tuesday, Oct 28th

- #1) Anyone at IU can easily get loaned a bike for free via the Crimson Cruisers bike exchange program
 - A) Yes
 - B) No
- #2) Tap water can be even healthier than bottled water.
 - A) Yes, tap water is regulated more strictly
 - B) It all looks the same to me
 - C) But bottled water has a label on it, so it must be better, right?
- #3) Worldwide, how much money is spent on bottled water each year?
 - A) \$50 million
 - B) But vitamin water!
 - C) \$200 million
 - D) \$100 billion
- #4) If left open, a laboratory fume hood can use more energy than a house.
 - A) True
 - B) False

- C) What's a fume hood?
 - #5) How much electricity is needed to heat water (per gallon)?
 - A) 15 watts
 - B) 50 watts
 - C) 129 watts
 - D) 2 watts
 - Answers
 - A, A, D, A, C
- Thursday, Oct 30th
 - #1) On average, how much lighting in the US is wasted?
 - A) about half
 - B) 1/3
 - C) none
 - D) 1/10
 - #2) About how much money a year is spent on wasted lighting?
 - A) \$1 million
 - B) You have to pay for electricity?
 - C) \$2 billion
 - D) \$50 million
 - #3) Turning off the water while brushing your teeth can save up to 50 gallons/week.
 - A) True
 - B) False
 - #4) When doing laundry, it is important to match the water level to the size of the load to save energy
 - A) True
 - B) False
 - #5) Even a small drip can still waste up to 20 gallons of water a day
 - A) True
 - B) False
 - Answers
 - B, C, A, A, A
- Tuesday, Nov 4th
 - #1) How long is the IU Campus Garden at Hilltop Garden open throughout the year?
 - A) Only during the summer
 - B) All year long
 - C) May-September
 - D) October-March
 - #2) How much energy use in the US is residential?
 - A) 12%
 - B) 50%

- C) 20%
 - D) 80%
 - #3) For what purpose is the majority of energy used?
 - A) To power cars and heat/cool homes
 - B) To cook Ramen
 - C) To power the Internet
 - D) To heat water
 - #4) How much oil is squandered on wasted lighting each year?
 - A) 50 million
 - B) 2 million
 - C) 20,000
 - D) 30 million
 - #5) What's an easy way to save money and help the environment?
 - A) eating more Ramen
 - B) using more plastic
 - C) drinking tap water out of a reusable water bottle
 - D) eating more beef
 - Answers
 - B, C, A, D, C
- Thursday, Nov 6th (Review Quiz)
 - #1: What is Peak Demand?
 - A) a song by the Beatles
 - B) another name for a carbon footprint
 - C) how much energy and individual uses
 - D) the highest capacity for electricity required in a certain period
 - #2: What is phantom energy?
 - A) the amount of energy saved by switching from an energy inefficient device to a more efficient one
 - B) The electricity that electronics use when plugged in, even if the device is turned off
 - C) The amount of electricity saved by not using an electronic device
 - D) a horror movie
 - #3: What is a kilowatt hour?
 - A) unit for measuring time
 - B) a fancy watch
 - C) unit for measuring water consumption
 - D) unit in which electricity is measured by most utilities
 - #4 Do electronic devices use energy when plugged in, even if they are turned off?
 - A) Yes
 - B) No
 - #5 Does drinking bottled water have a negative impact on the environment?

- A) Yes
- B) No
- Answers
 - D, B, D, A, A

3 ENERGY CHALLENGE BREAKFAST, WORKSHOPS, AND GREEK KICKOFF

See attached related Powerpoint presentations.

4 #IU ENERGY CHALLENGE

Participants take pictures of themselves taking part in certain sustainable activities fall under the four categories of Electricity, Water, General Sustainability, and Creativity (outlined below). Players then either post the pictures to the IU Energy Challenge Facebook page or tweet them to the IU Energy Challenge (@HoosierEC) with their name, residence center (or Greek chapter, and #iuenergychallenge. Participants are limited to posting 3 pictures per day.

Students receive one point for each picture posted and can redeem points earned for gift cards (a list of options can be seen below). A representative for each residence center or Greek chapter will be notified every week of participants' point accumulations. In addition, players can email iuec@indiana.edu if they have questions regarding points.

After the end of the Energy Challenge, students email us at iuec@indiana.edu with their name, residence or Greek chapter, and gift card selection. Gift cards will be mailed to students via Campus Mail.

Electricity

- Taking the stairs instead of the elevator
- Turning off lights when leaving the room
- Unplugging chargers when not in use
- Using a drying rack instead of a dryer
- Checking out the Energy Matters app on IU Mobile
- Using task-oriented lighting instead of lighting an entire room
- Setting computer to sleep or turning it off when not in use

Water

- Washing laundry in cold water
- Matching water level to the size of the load when doing laundry
- Avoiding use of a tray in the dining halls
- Reporting leaks to (812)855-3740
- Avoiding use of air conditioning/heat
- Washing dishes in a dishwasher instead of by hand

General Sustainability

- Eating meals with no meat
- Recycling
- Getting your dorm room Green Room Certified
- Using a reusable water bottle
- Checking out energychallenge.indiana.edu
- Riding a bike
- Taking the bus
- Participating in Campus Garden Workdays

Creativity

- Show us YOUR best idea for conserving electricity and water or promoting general sustainability

5 RECOMMENDATIONS FOR THE NEXT INTERN

The following is a list of suggestions for future work.

- Contact Prof. Cathrine Reck of the Chemistry Building (creck@indiana.edu) to discuss water-saving equipment
- Discuss with Kristin and Bill the merits of trying to run the IU Eco-App again- maybe have a group from the School of Informatics and Computing create the software?
- Hold lots of events! Hosting a workshop, Power Hour, Greek night, Energy Challenge Breakfast, and Energy Challenge Awards every semester is very time intensive, but a great way to get people involved!
- Try to have a good electronic presence- definitely a weak spot for me. I had never even used Twitter before managing the IUEC account, and I did not post online as much as I could have.
- Outreach is incredibly important- go for any great new ideas!

