

# Campus EH&S Technology Workshop

Duke University and Quality Attributes  
Software, Inc.



A leader in implementing innovative ways  
to promote and manage their  
sustainability efforts....

# Main Purpose:

- Educate
- Energy Management Tool



# What is a GreenTouchscreen®?

- A software based touchscreen kiosk:
  - Developed for green building education and outreach
  - Interactive
  - Internet based
  - Custom designed and developed

The screenshot displays the user interface of a GreenTouchscreen kiosk for Morrill Hall at Iowa State University. The interface is designed for a touchscreen and includes the following elements:

- Header:** "IOWA STATE UNIVERSITY Morrill Hall" on the left and a weather widget on the right showing "72° Partly Cloudy" with a sun and cloud icon.
- Navigation Menu:** A vertical sidebar on the left with buttons for "Home", "Building Directory", "Calendar", "Green", and "Morrill Hall".
- Main Content Area:**
  - Welcome to Recently Renovated Morrill Hall:** A section featuring a photo of the building and a text block stating: "Morrill Hall is the first example of sustainable building on the Iowa State Campus. Restored at the request of President Gregory Geoffroy and funded by the generosity of over 3000 individuals, the building is a testament to the dedication of Iowa State alumni, students, faculty, staff and friends to the land grant heritage of the Iowa State campus."
  - Friday, January 19, 2007:** A section with a "View Calendar" button. It includes a "Did you know?" box with the text: "Morrill Hall was originally built in 1890 and is the second oldest building on campus. The oldest building is the Farm House (1865)." Below this is a table of events:

8:00am - 9:00am	Lorem ipsum dolor sit amet, consectetur adipiscing.
9:30am - 10:00am	Duis tempus nibh non magna. Duis gravida.
10:00am - 12:00pm	Etiam at nibh. Vivamus in purus. Phasellus.
2:00pm - 3:00pm	Nunc dapibus imperdiet nisi. Proin auctor, erat.
  - Donor Recognition - The Campbells:** A section with a photo of a couple and the text: "It all started with one family and a desire to keep a historic building on central campus alive. Lyle(66) and Nancy Campbell led the way with a leadership gift and many donors followed." Below this is a "Learn More" button.

The footer of the interface includes the Iowa State University logo with the tagline "Becoming the best." and the GreenTouchscreen logo.

# Benefits

- MOTIVATE
- ENGAGE
- MARKET
- EDUCATE & INFORM

The screenshot displays a web application interface for Consumers Energy. At the top, there is a weather widget showing: Wind: 13.1 mph W, Humidity: 57% RH, Pressure: 31.76 in, Dew Point: 39.2°F, UV Index: 3.7, Rain Fall: 0 in, Soil: 58.4°F (3°) 61.2°F (6°), 55°F Partly Cloudy. Below the weather is a navigation menu with tabs for Energy Technology, Emerging Technology, Wind, and Geothermal. The main content area features a diagram titled "How a wind turbine works" with various components labeled: Blades, Rotor, Anemometer, Low Speed Shaft, Gear Box, Generator, Controller, Brake, Yaw Drive, High Speed Shaft, Pitch, Yaw Motor, and Tower. To the right of the diagram is a text box titled "So how do wind turbines make electricity?" which explains that wind turbines use wind to make electricity, unlike fans which use electricity. Below this is a section titled "Yaw Drive" with a star icon, explaining that upwind turbines use a yaw drive to keep the rotor facing into the wind, while downwind turbines do not. A "Close Window" button is located at the bottom right of the content area. The footer includes the Consumers Energy logo and the text "Your Touchable Energy Cooperative".

**CONSUMERS ENERGY**  
Your Energy Cooperative

Wind: 13.1 mph W Humidity: 57% RH Pressure: 31.76 in  
Dew Point: 39.2°F UV Index: 3.7 Rain Fall: 0 in Soil: 58.4°F (3°) 61.2°F (6°) 55°F Partly Cloudy

Energy Technology Emerging Technology Wind Geothermal

### How a wind turbine works

Blades, Rotor, Anemometer, Low Speed Shaft, Gear Box, Generator, Controller, Brake, Yaw Drive, High Speed Shaft, Pitch, Yaw Motor, Tower, Nacelle

**So how do wind turbines make electricity?**

Simply stated, a wind turbine works the opposite of a fan. Instead of using electricity to make wind, like a fan, wind turbines use wind to make electricity.

The wind turns the blades, which spin a shaft, which connects to a generator and makes electricity.

**Yaw Drive** ★

Upwind turbines face into the wind; the yaw drive is used to keep the rotor facing into the wind as the wind direction changes. Downwind turbines don't require a yaw drive because the wind blows the rotor downwind.

Close Window

Your Touchable Energy Cooperative

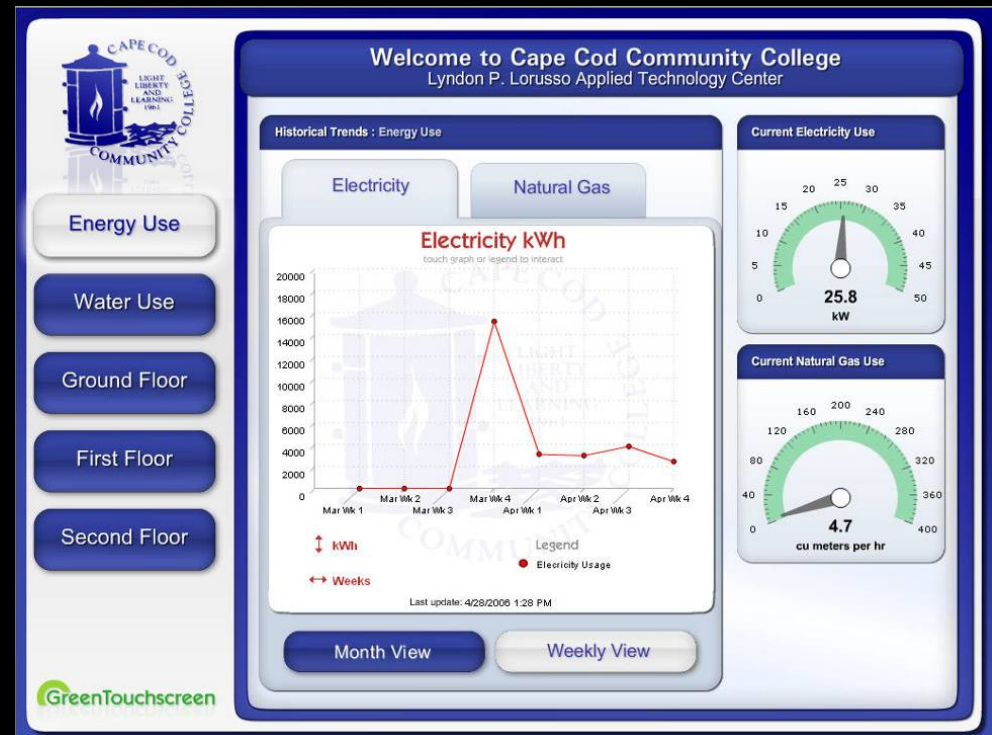
# Web Based

- Available to anyone, anywhere, at any time
- Increased versatility, scalability & reliability
- Easy to update



# Custom Designed and Developed


- Complement existing marketing material
- Involved clients:
  - Initiation
  - Design
  - Development
  - Testing
  - Support



# Green Touchscreens and LEED®

## Innovation and Design credit

SMU ENGINEERING *S. Lindsay Embrey Engineering Building* GreenTouchscreen Español

LEED® Checklist - Sustainable Sites  LEED® Checklist - Materials & Resources

Sustainable Sites Water Efficiency Energy & Atmosphere Materials & Resources Indoor Environment Quality Innovation & Design Process

Select a category to view the... Select a category to view the points earned from that category. Select a point earned to view more information about that point.

Check	Points	Credit	Description
<input checked="" type="checkbox"/>	Req	Prereq 1	Storage and Collection of Recyclables
<input checked="" type="checkbox"/>	+1	Credit 2.1	Construction Waste Management - Divert 50%
<input checked="" type="checkbox"/>	+1	Credit 4.1	Recycled Content - 5% of post consumer plus 1/2 post industrial
<input checked="" type="checkbox"/>	+1	Credit 4.2	Recycled Content - 10% of post consumer plus 1/2 post industrial
<input checked="" type="checkbox"/>	+1	Credit 5.1	Local & Regional Materials - 20% Manufactured Locally
<input checked="" type="checkbox"/>	+1	Credit 5.2	Local and Regional Materials - of 20% Local Materials, 50% Harvested Locally

### Storage and Collection of Recyclables

**Req Point**

Intent: Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Results: SMU and the construction contractor performed the sorting of recyclables as part of the waste collection.



Close Window

Home Building Building Info Green Info Green Map

# Expandability

- Options:
  - Similar kiosks with common & unique data
  - Kiosk network with common data
- Kiosk locations
- Economies of scale

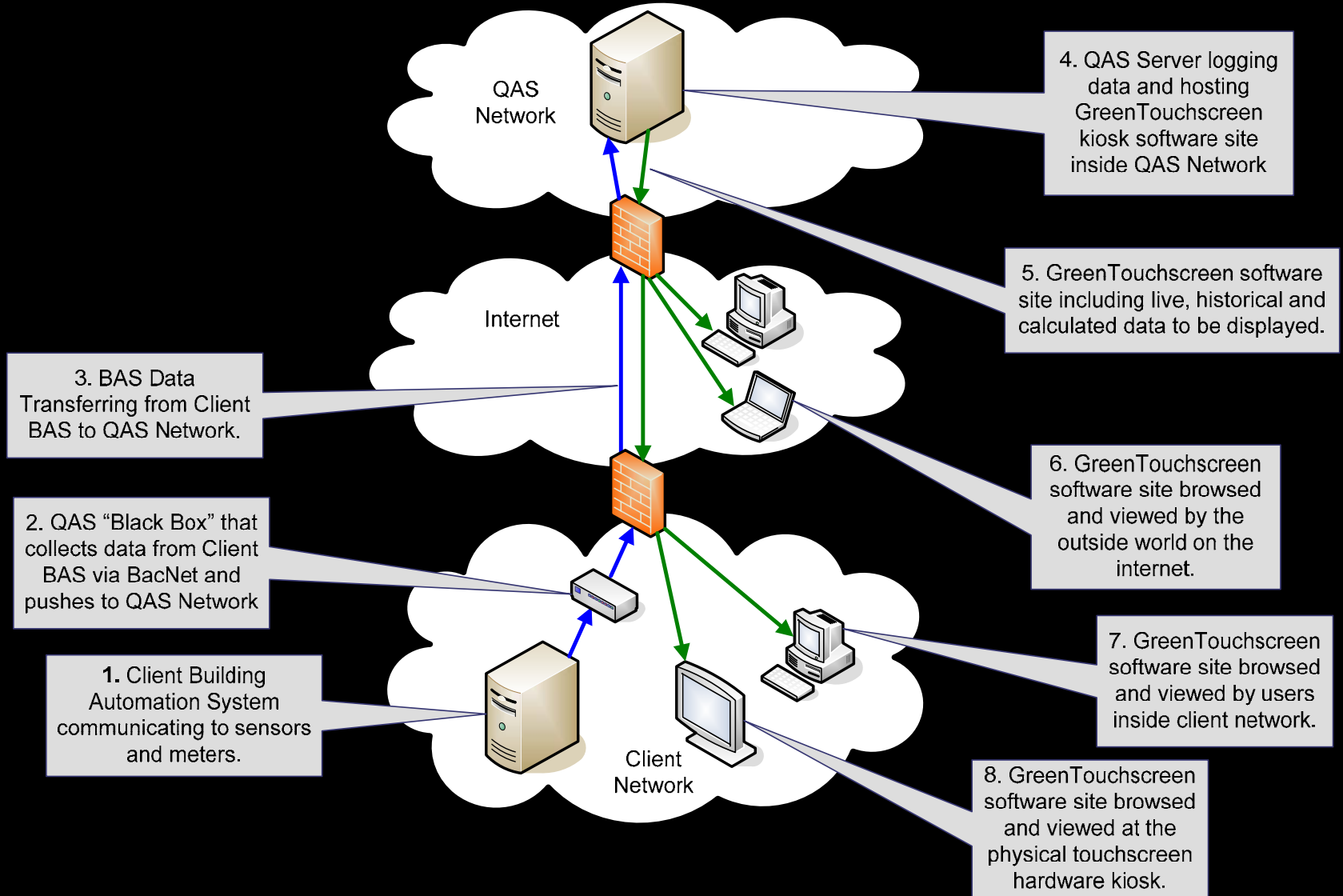


Samples....

Questions?

*Thank you!!*

# How Does it Work?



# Required Hardware

- A touch screen monitor
  - Multiple sizes
- Internet connectivity
- Power
- Mounting structure





Home

My Residence Hall

Comparison

Competition

Welcome to the  
**Building Performance**  
Interactive Kiosk for the  
Boston University!

### School Partnership Program

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean nec justo sed tellus pharetra pulvinar. Vivamus non ligula. In cursus eros in lacus. Quisque metus elit, luctus quis, mattis ut, pharetra non, diam. Aenean eu urna eget lacus accumsan mollis. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Curabitur quis sem. Suspendisse potenti. Maecenas lectus justo, aliquam vitae, gravida non, commodo et, massa.

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### Program Information

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean nec justo sed tellus pharetra pulvinar. Vivamus non ligula. In cursus eros in lacus. Quisque metus elit, luctus quis, mattis ut, pharetra non, diam. Aenean eu urna eget lacus accumsan mollis. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Curabitur quis sem. Suspendisse potenti. Maecenas lectus justo, aliquam vitae, gravida non, commodo.

Learn More



Home

**My Residence Hall**

Comparison

Competition

Now

Today

**Week**

Month

Semester

Year

### Electricity Use

Electricity Week Comparisons For 2006

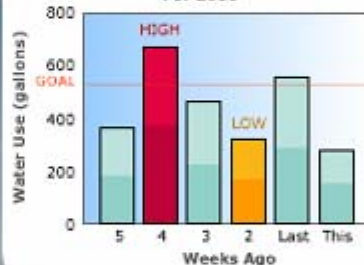


Electricity Use For This Week

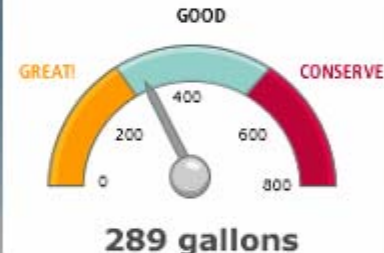


### Water Use

Water Week Comparisons For 2006



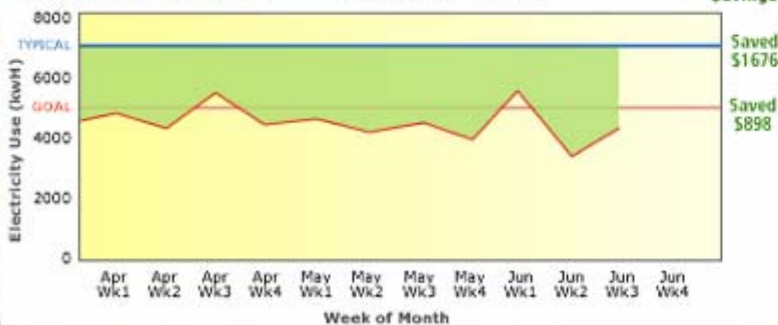
Water Use For This Week



Historical Electricity Use

April, May and July 2006

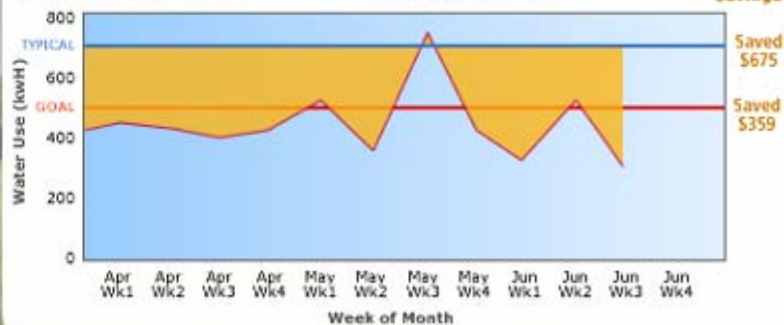
Electricity Savings



Historical Water Use

April, May and July 2006

Water Savings



Your Residence Hall Name, Your Campus Area

Home

My Residence Hall

**Comparison**

Competition

Now

Today

**Week**

Month

Semester

Year

## Usage Comparisons

### Electricity Comparisons



**300**

Gallons of Gas



**467**

Hours Of Playing Xbox



**34**

Times You can Drive from NY to SF



**65**

Train Cars of Coal

Electricity Use For This Week



You Residence Hall has spent

**\$300** That's 1200 quarters!

Vs. Typical Hall



**\$150** Short of Goal Savings

**\$1200** Actually Consumed

### Water Comparisons

Water Use For This Week



Your Residence Hall has saved

**\$95** That's 380 quarters!

Vs. Typical Hall



**\$35** Total Goal Savings

**\$1000** Actually Consumed

**46**

Gallons of Milk



**27**

Total Showers



**678**

Cans of Soda



**16**

Swimming Pools





Home

My Residence Hall

Comparison

Competition

Residence Hall 1

1st

FIRST PLACE

Residence Hall 2

2nd

SECOND PLACE

Residence Hall 3

3rd

THIRD PLACE

Residence Hall 4

4th Place

Residence Hall 5

5th Place

Residence Hall 6

6th Place

Residence Hall 7

7th Place

Residence Hall 8

8th Place

Residence Hall 9

9th Place

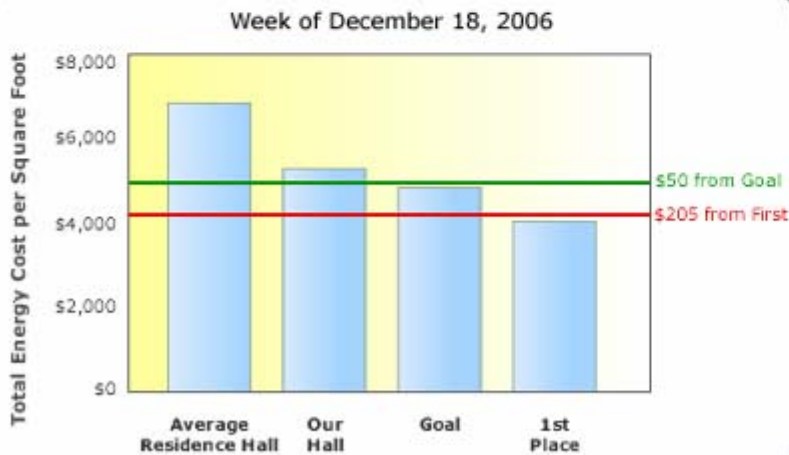
Residence Hall 10

10th Place

## Residence Hall Competitions

Tip: Did you know you can catch up to the first place residence hall if you turn off the lights in 10 rooms for 2 hours.

### Overall Week Energy Use



### Overall Year Energy Use



# BOSTON UNIVERSITY

## Weather Info

October 25, 2006 @ 1:38pm



# 64°

Boston, MA

Partly Cloudy

18°C

Winds: WSW 7mph

Humidity: 58.7%

Pressure: 30.19 mb

Dew Point: 37°F

UV Index: 9 very high

Tomorrow



62° 56°

## Energy Savings

Building Average per person  
**\$2.50 used per hour**

Building Goal per person  
**\$1.25 used per hour**

Status:  
**50% over budgeted goal**

Last year the University of Hawaii spent  
3.5 million dollars on energy use

## Comparisons

Compare **42kWh (\$2.50)** to:



# 1.0

Gallons of Gas



# 1.3

Hours of Playing Xbox



# 0.5

Times You can Drive from NY to SF

## Competitions

# 4

Your Building is currently ranked 4th

1. Building
2. Building
3. Building
4. Your Building
5. Building
6. Building
7. Building
8. Building
9. Building
10. Building

## Energy Use

Electricity

Water

CO2



Building Name  
46.1kW

Building Name  
56kW

Building Name  
33kW

Building Name  
5.8kW

Building Name  
56kW

Building Name  
3kW

Building Name  
12kW

Zoom Out

Zoom In

Touch Map to Interact

Widgets:

Donors Sponsors

News Reel

Compare

Compete

Energy Use Goals

Energy Use

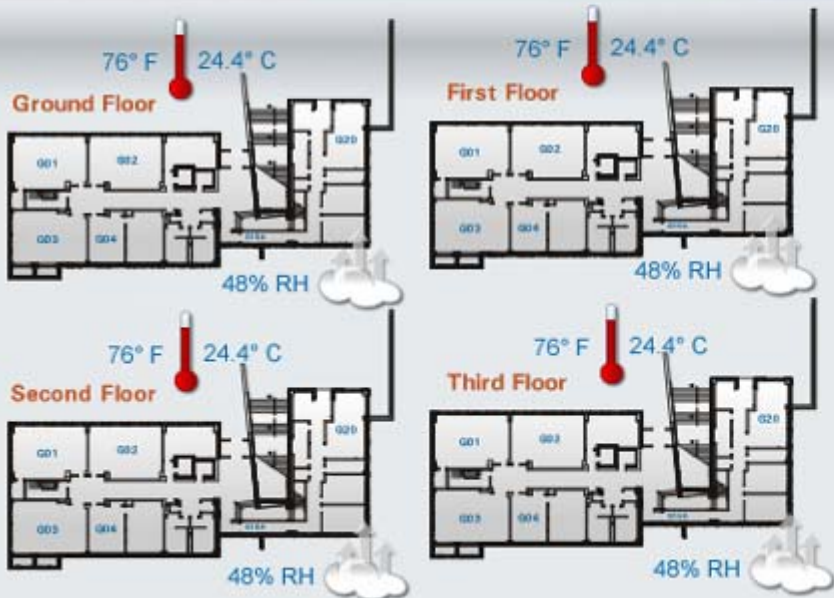
Energy Savings

Calculate Use

Water Pipes Show

Power Lines Show

Building Name - Campus Name



### Energy Savings

Floor Average per person  
**\$2.50 used per hour**

Floor Goal per person  
**\$1.25 used per hour**

Status:  
**50% over budgeted goal**

Last year the University of Hawaii spent 3.5 million dollars on energy use

### Energy Use

Electricity Water CO2



### Competitions

**4** Your Floor is currently ranked 4th

1. Floor
2. Floor
3. Floor
4. Your Floor
5. Floor
6. Floor
7. Floor
8. Floor
9. Floor
10. Floor

### Comparisons

Compare **42kWh (\$2.50)** to:

**1.0** Gallons of Gas

**1.3** Hours of Playing Xbox

**0.5** Times You can Drive from NY to SF



Touch Floor to Interact

Widgets:

Donors Sponsors | News Reel | Compare | Compete | Energy Use Goals | Energy Use | Energy Savings | Calculate Use | Lights On or Off Show | Windows Open or Closed Show



Select Residence Hall

- Residence Hall 1
- Residence Hall 2
- Residence Hall 3

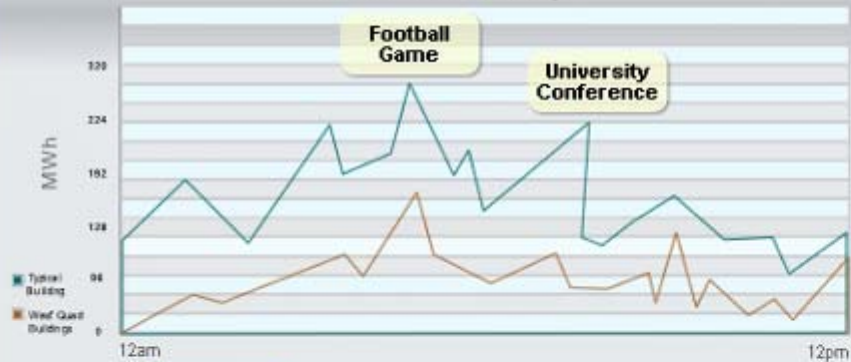
Select Floor

- Floor 1
- Floor 2
- Floor 3

### Events - Electricity and Water Usage

Current as of 2/24/2006 10:56PM

3594.14 Total kWh used today



- Now
- Today
- Week
- Month
- Semester
- Year

### Residence Hall 1 - Floor 1

Electricity



Water



CO2 Emission



- Now
- Today
- Week
- Month
- Semester
- Year

### Residence Hall 2 - Floor 3

Electricity



Water



CO2 Emission



- Now
- Today
- Week
- Month
- Semester
- Year

### Residence Hall 3 - Floor 1

Electricity



Water



CO2 Emission



- Now
- Today
- Week
- Month
- Semester
- Year