Sustainability at the University of Illinois at Urbana-Champaign

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Experimental Plots in Urbana. Corn, Switchgrass, and Miscanthus side-by-side. This photo was taken in June. Fields in Second year of growth. 6 acres miscanthus, 3 acres switchgrass. Photo courtesy Andrew Leakey 2006


Sustainability Policy and Goals

Sustainability Policy and Goals

- Energy reduction policy – 10% in 3 years (from FY07-FY10)
  - 20% reduction in 2 to 6 years from FY10
  - 25% reduction over 10 years
- Signatory to American College and University Presidents Climate Commitment
  - Required to develop plan to reach carbon neutrality
  - Several intermediate requirements
- Signatory to Illinois Sustainable University Compact
  - Committed to 8 of 12 goals
- All new construction or major renovations must be LEED Silver Certified at a minimum. Others should strive to meet Silver as much as possible.
- Several aspects of sustainability in Campus Strategic Plan
- Previous committees developed plans that have not been enshrined
- Need for comprehensive sustainability policy

Benchmarking Importance

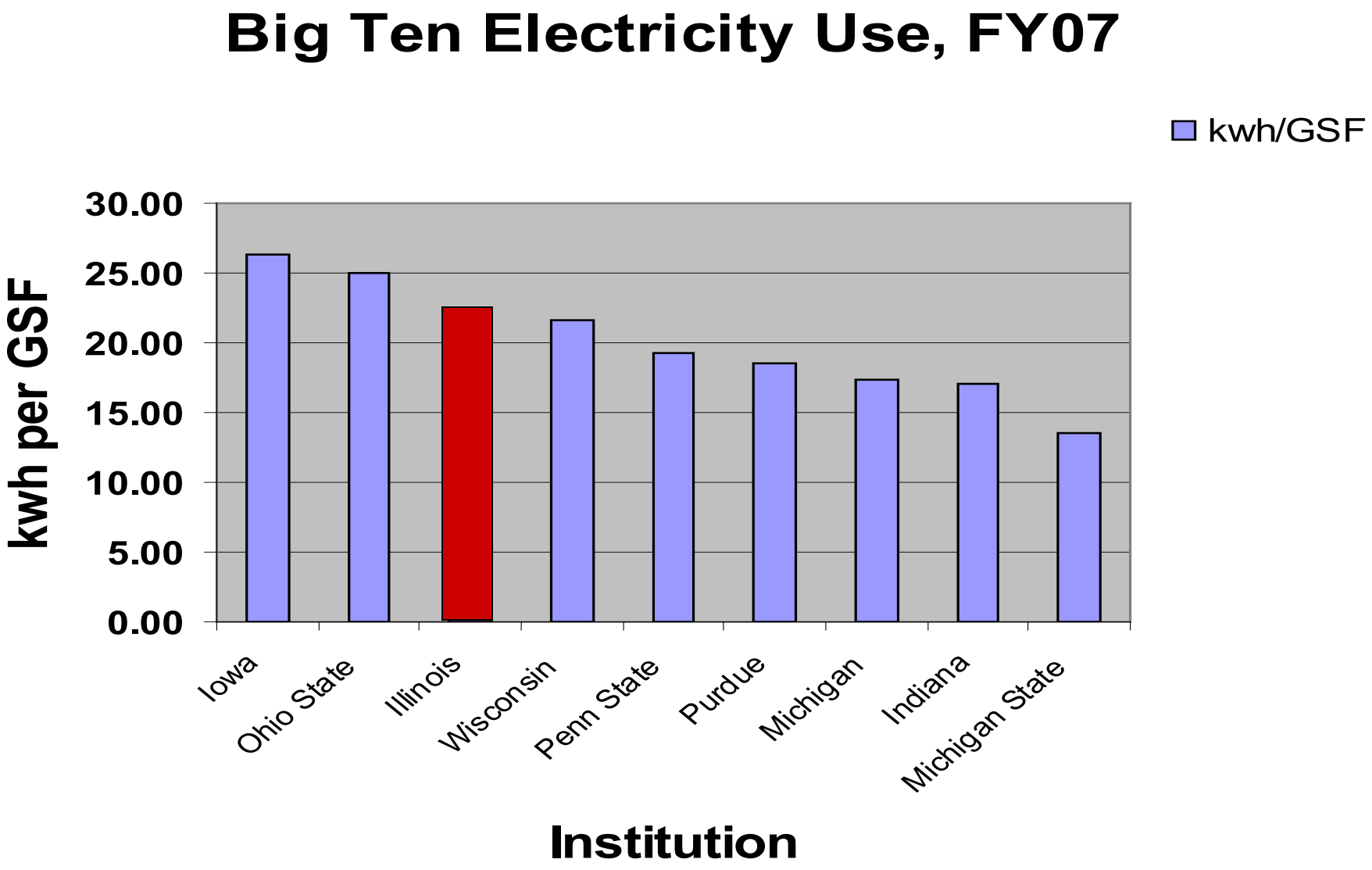
- Must know where we stand
- Regardless of how well we are performing in a certain area, it needs to be available to campus to provide impetus for change
- Necessary for setting goals
- Important to track progress and confirm we are making progress at an adequate pace


Energy Conservation Efforts

Urbana Campus Energy Costs:

FY 2003:	*$26,612,000*	
FY 2004:	*$35,684,000*	*(+34%)*
FY 2005:	*$52,282,000*	*(+47%)*
FY 2006:	*$70,778,000*	*(+35%)*
FY2007:	*$58,830,000*	*(-17%)*
FY2008:	*$78,400,000*	*(+33%)*

How do we compare?



Urbana Campus Carbon Footprint, FY08

Abbott PP, nat. gas	*203,465 tons*	***38.9%***
Abbott PP, coal	*167,294 tons*	***32.0%***
Abbott PP, oil	*72 tons*	***0.0 %***
Other campus burn	*5,629 tons*	***1.1 %***
Purchased Electricity	*109,143 tons*	***20.9 %***
	Stationary sources	***92.9 %***
All UIUC vehicle emissions	*5,656 tons*	***1.1 %***
Employee Commuting	*14,015 tons*	***2.7%***
Annual Air Travel	*17,484 tons*	***3.3%***
TOTAL	***522,757 tons***	

12 Highest Energy Consumers, FY08

1.	Roger Adams Lab	126,441 MMBtu
2.	Advanced Computation	126,321
3.	Beckman Institute	109,224
4.	Vet Med/Basic Science	107,520
5.	Veterinary Tch'g Hosp.	107,360
6.	Micro/Nano-electronics	105,541
7.	Institute for Genomic Biology	98,803
8.	Siebel Ctr for Comp.Sci.	91,974
9.	Chem/Life Sciences	84,128
10.	Madigan Laboratory	83,228
11.	Digital Computer Lab	70,370
12.	Illini Union	68,684

30% of campus consumption

Reduced consumption nets huge benefits

- Each 1% reduction is worth $500,000+ and 5,200 tons of annual carbon emissions
- 8.2% energy reduction returns CO2 emissions to 2000 levels
- 19.7% energy reduction returns emissions to 1990 levels

Energy Goals Progress

- Reduced energy consumption per square foot (Energy Intensity)
- FY08 to FY08 – 3.5%
- FY08 to FY09 (first 9 months) – 9.5%
- If trend holds, on track to exceed goals

PROGRESS TO DATE …

- ✓ Developed a campus Energy Use Policy
- ✓ Installed new steam and/or chilled water meters in 80+ buildings (80/90%)
- ✓ Developed detailed energy statements for colleges and admin units showing their utility usage in the “Big Eighty”
- ✓ Implemented a retro-commissioning program *(averaged 27% reduction in 1,400,000 GSF so far)*
- ✓ Began a major lighting retrofit/upgrade program
  - ✓ 15 Buildings Complete - > 40 buildings in 1st phase
  - ✓ 40% reduction in lighting fixture consumption
  - ✓ ICECF Grant of $1.2M
  - ✓ ~$1M in annual savings

MORE …

- ✓ Implemented comprehensive steam trap maintenance program

  (Campus steam use reduced 12%+ FY06 to FY08)
- ✓ Adopted LEED standards for all major construction (>$5M – LEED Silver Certification)
- ✓ Developed RFP for Performance Contracting (ESCOs)
- ✓ USEPA “Energy Star” partner
- ✓ Joined the Presidents’ Climate Commitment

Krannert Center Retro-commissioning

- **Work done November- December 2007**
  - $418,000 saved per year in energy costs
  - 31% reduction in energy consumption
  - RCx cost of $188,000
  - Simple payback – less than 6 months

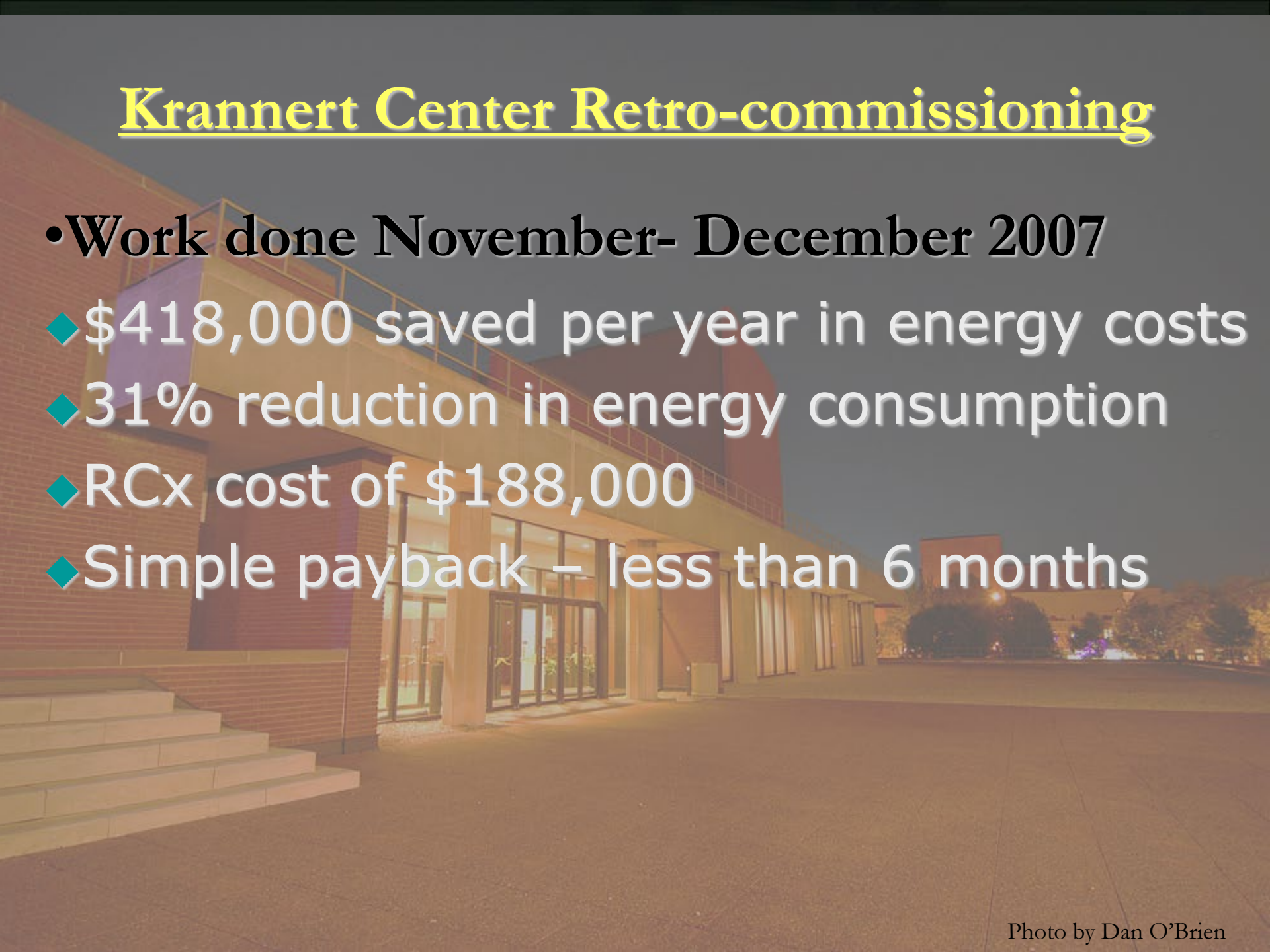


Photo by Dan O'Brien

The ten year plan, in simplest form …

- **Improve systems**
- **Control growth**
- **Create incentives**
- **Facilitate behavioral change**
- **Stimulate investment**

Energy Program must address three key areas:

I Building/System Modifications & Upgrades

II Campus Culture shift

- Information and Awareness
- Incentives
- Policy changes

III Improved Communication/Coordination

e.g. Generation vs Consumption


Sustainability in Operations

Recycling Methods

- Collection: Individuals sort recycling into bins before collection. Results in highest percentage by weight of recyclables (~90% - mostly paper and cardboard).
- Sorting: Employees at Waste Transfer Station sort through waste stream and pick out recyclables

- Residence Hall exception: Waste stream in dorms has too much wet materials to sort.

Recycling Figures (FY 08)

- Recycled or diverted nearly 50% of waste (excluding construction and demolition)
- 2,074 tons of paper and cardboard
- 41 tons of aluminum cans
- 625 tons of scrap metal
- 1,300 tons of landscape waste
- 325 tons of pallets
- 21 tons of plastic (No. 1 and 2)

http://www.fs.uiuc.edu/maintenance/wastemanagement/wastemanagement.cfm

Grounds

- No-mow zones
- Leaves composted and reused at nursery
- Limbs chipped and reused; rest is mulched
- Irrigation is minimal – (~12-14 acres)
- Irrigation systems use timers, can be shut off with adequate precipitation
- Monitors for pest management; no pre-treatment
- Used organic pesticide like insect soaps, horticultural oils
- Reduced chemical usage by ~60% over last 5-7 year; spot treatment instead of spray
- Minimization of fertilizer
- Experimentation with native plantings – prairie dropseed, bluestem
- Most plant material is purchased nearby
- Very rarely planting in native soil
- Snow removal: salt brine spraying – better for plants, less corrosion

Printing Department

- Course packets are 100% post-consumer recycled and processed chlorine free
- Estimated 40% paper used is recycled (mostly 30%)
- Carries some Forest Stewardship Council certified paper
- Offset printing only uses vegetable inks (State of Illinois requirement)
- Purchases mostly from Wisconsin and Ohio
- Barrier – must be cost competitive with outside bidders
- Several units request recycled stock

Transportation

- CUMTD available to all students, staff, and faculty
- Parking Review Committee
- Car share (Zipcar)
- Bike share within Kinesiology and DURP
- Impounded/unclaimed bikes given to the Bike Project cooperative
- Several electric and fuel efficient gas-powered vehicles in F&S fleet
- Car Pool has a Prius, ordered three Ford Escape hybrid SUVs, and requested a proposal to purchase 24 hybrid sedans
- Idling and fuel consumption monitoring in 50-60 vehicles
- Some vehicles using E85

Dining/Housing

- Preference for locally processed or produced items ~25% of purchases
- Some organics – typically mixed greens and tofu. Additional products if available and meets budgetary requirements
- Leftovers deemed “safe to eat” donated to local food banks
- Trayless pilot at PAR – cuts food waste
- Project to convert waste oil to biodiesel
- Vegetarian dining hall – Field of Greens
- First dorm energy contest pilot at beginning of semester
- Small research-based composting program

Business Instructional Facility

- First building on campus attempting LEED Certification
- Confident with Gold rating: slight chance of Platinum
- Opened in August, 2008. Commissioning still in process

Business Instructional Facility

- Estimated to reduce energy costs by 50% - about $300,000 per year
- Photovoltaic panels – (4,000 SF ~ 8% of electricity)
- Two extensive green roofs with monitoring
- Displacement ventilation system
- Carbon dioxide monitoring – demand control ventilation
- Triple pane windows
- High performance insulation
- Reflective zinc roofing
- Photosensor and occupancy controls for lighting
- Sited near public transportation
- Diversion of construction waste – over 90%
- Low-volume shower heads, toilets, and faucets reduce water consumption
- Bicycle changing and showering facilities
- Water efficient landscaping

Other LEED Projects

- Newmark Student Center Addition
- Huff Hall North Addition
- Lincoln Hall Renovation
- Petascale Computing Facility
- ECE Building
- Illinois Fire Services Institute
- Ikenberry
- IBRL
- Natural History Building
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Additional Sustainability Projects

- Aerator Installations
  - Installed 1,300 low-flow aerators in restrooms across campus
  - From 2 to 2.5 gpm down to 0.5 gpm
- Miscanthus-fired Boiler
  - Would provide steam and electricity to Vet Med Basic Sciences Building
  - Received grant from Illinois Clean Energy Community Foundation

Student Sustainability Committee

- Two fees passed by students unto themselves
- $2/sem. Cleaner Energy Technologies
  - Renewable energy and energy efficiency
- $5/sem. Sustainable Campus Environment
  - Broader: includes above categories plus additional initiatives, including education, sustainable resource purchasing, green buildings, sustainable campus development
- Students allocate funds via application process
- Previously funded projects
  - Illini Union audit and retrofits, PV Array and Green Roof on BIF, Biodiesel Initiative, E-85 Tanks, WMRC Lighting Retrofit, Vet Med Prairie, Solar Decathlon, Occupancy Sensors, Bike Parking, Student Operated Farm,