

Renewable Energy at the University of Illinois

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3.3.2010



Business Instructional Facility Building Overview

- LEED Platinum Certified
- First LEED certified building on campus
- Opened August 2008
- All Projects over \$5 Million
 - New Construction
 - Major Renovation
 - Silver Certified
- http://www.business.illinois.edu/instructional_facility/



Business Instructional Facility

Green Elements

- Designed to reduce energy costs by 51% over ASHRAE 90.1-1999 Baseline
- Building orientation/shading
- Displacement ventilation
- Demand control ventilation
- Triple-pane windows
- High performance insulation
- Extensive green roofs with monitoring
- Photo/occupancy sensors for lights
- Efficient water fixtures
- Diversion of construction waste – 93%
- Native vegetation



Business Instructional Facility

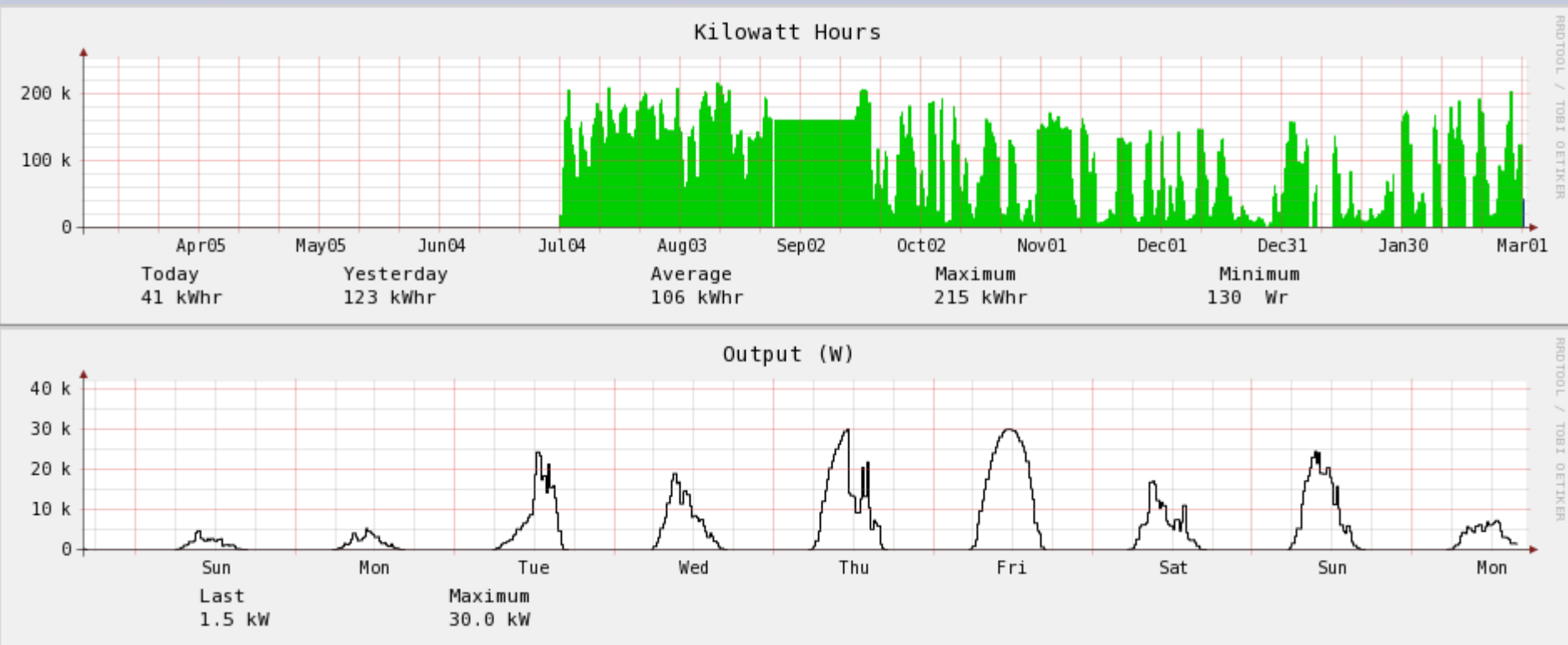
Solar Photovoltaic Panels

- 33kW (168 x 195W Panels)
- ~7% of building energy
- Grid-tied
- Funded by Illinois Clean Energy Community Foundation and the Student Sustainability Committee
- Educational kiosks/website



Business Instructional Facility

Solar Photovoltaic Panels



<http://www.business.illinois.edu/SolarPanels/>



Biomass CHP Pilot

- Run on biomass grown on South Farms
 - Miscanthus (100 acres)
 - Switchgrass
 - Prairie mix
- Steam and electricity to Veterinary Medicine Basic Sciences Building – 5th largest energy user
- Support research efforts of Energy Biosciences Institute
- Funded by ICECF and internal sources



Biomass CHP Pilot

- Target completion by end of year
- Estimated generation
 - 35% of building's steam
 - 2% of building's electricity



Biodiesel Initiative

- Student project to convert waste vegetable oils from dining halls to biodiesel for use in University fleet
- Conceived in fall of 2006
- Students designed reactor, pick up oil, and produce the fuel
- 80 gal batches – ramping up to 320 gal
- First 275 gals accepted in Oct' 09
- Est. annual production of 12,800 gals
- Funded by SSC
- Supported by the Illinois Sustainable Technology Center
- <http://biodiesel.illinois.edu/>



Algae Sequestration and Biodiesel

- Abbott Power Plant flue gas to be used as feedstock for algal bioreactor system
- Biodiesel will be combined with other project
- Construction underway – completed by April
- ~60 gallons per year
 - May scale up



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Solar Decathlon

- International competition sponsored by DOE's Office of Energy Efficiency and Renewable Energy and the National Renewable Energy Laboratory
- Ten contests to determine most energy-efficient and attractive home powered entirely by the sun
- Great educational experience for students



U . S . D E P A R T M E N T O F E N E R G Y

SOLAR DECATHLON

POWERED BY THE SUN

Solar Decathlon 2007

- Illinois' Elementhouse
- Won two of ten contests
- 9th overall
- Located at Chicago Center for Green Technology
- Sponsors included ICECF



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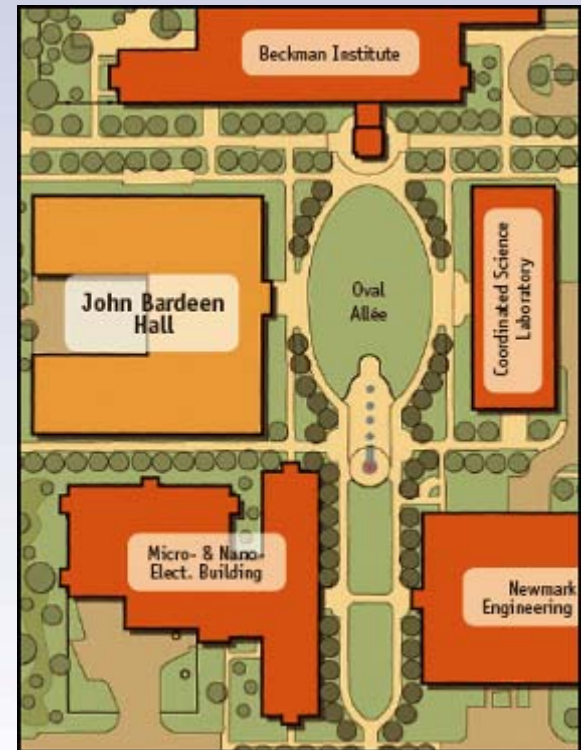
Solar Decathlon 2009

- Illinois' Gable House
- 2nd overall – 1st in nation
- 1st in three competitions
- 2nd in three competitions
- Located south of iHotel
- Sponsors include ICECF and SSC



John Bardeen Hall

- New building in design for the Electrical and Computer Engineering Department
- 250,000 sf
- Net-zero energy goal
- Estimated 300 kW PV on roof
- More on nearby parking garage
- Chilled beams
- Heat-rejection chiller



Allerton Ground-Source Heat Pump

- Project developed by Allerton Park and Retreat Center staff
- Horizontal system
- Four buildings – 23 tons total
- Use of in-house labor
- Initial stages
- Partial funding from DCEO Large Customer ARRA Stimulus Program



South Farms Wind Turbine

- Project to install 1.5 MW utility scale turbine(s) on the South Farms
- Started by students circa 2004
- One up to three back down to one
 - Costs higher than expected
 - Difficulty finding vendor for low quantity
 - Infrastructure for three
- Funds from SSC (\$500k), ICECF (\$2M)
- Total cost: \$4.5M



South Farms Wind Turbine

- Economic crisis stalled project in Dec. '08
- Looking for additional funding opportunities
- Coordination with other developments



Climate Action Plan

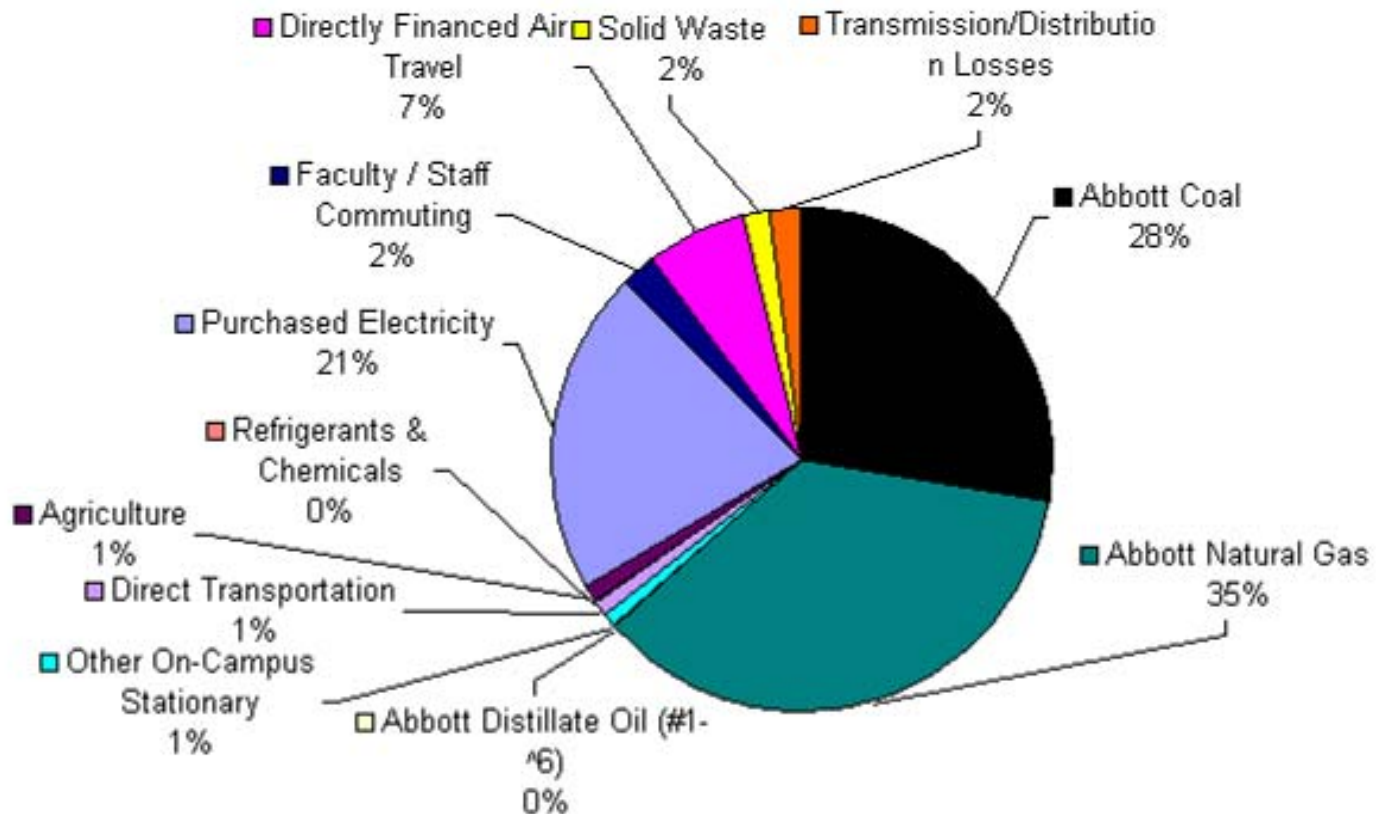
- Commitment to achieve carbon neutrality through American College and University Presidents Climate Commitment
- Plan in development – rough draft out
- Goal of carbon neutrality by 2050
- Conserve, conserve, conserve, renewables
- Recommendation to meet/exceed state RPS

<http://sustainability.illinois.edu/>



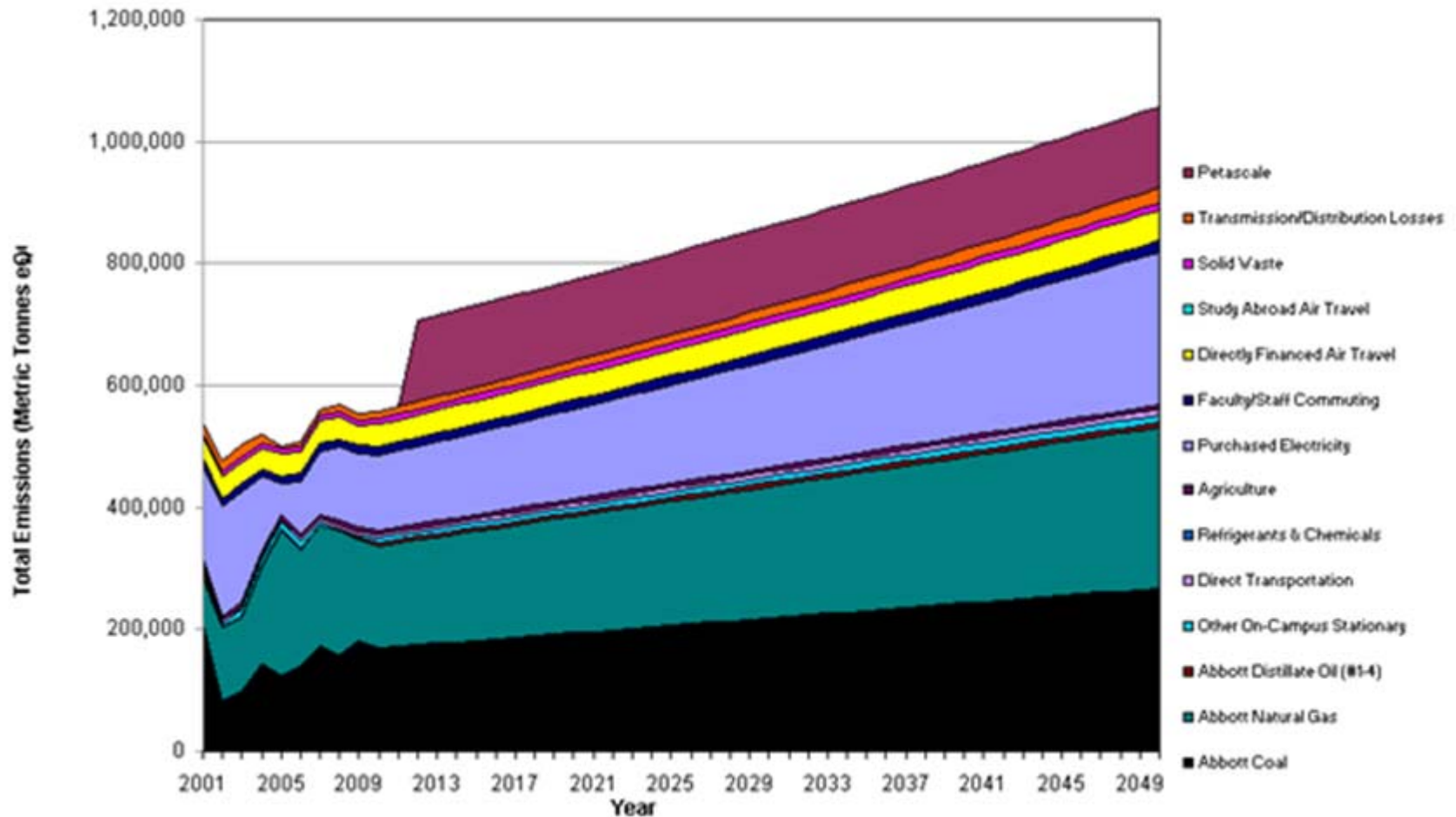
Climate Action Plan

- 2008 Baseline GHG Emissions

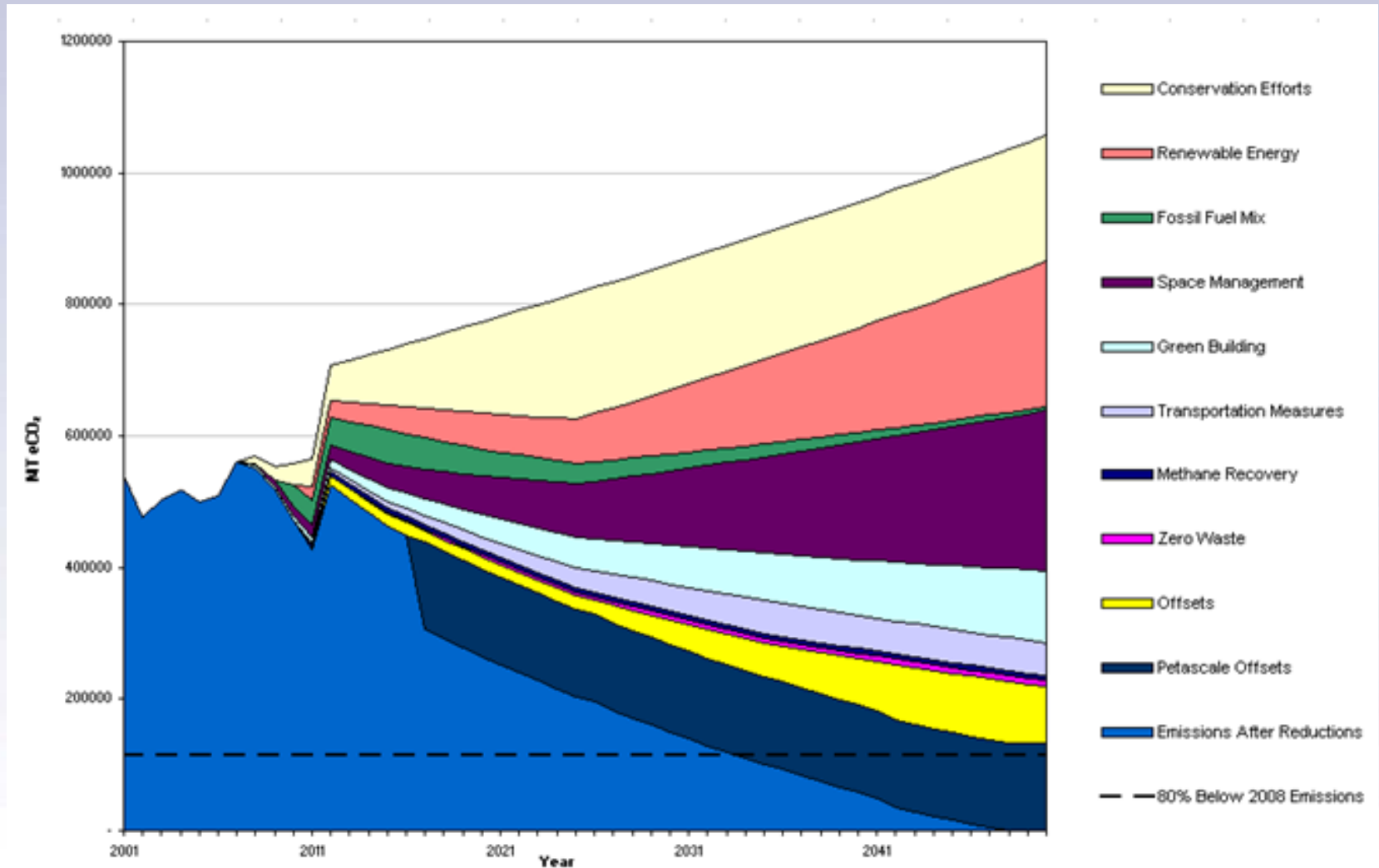


Climate Action Plan

- Business As Usual Scenario



- Mitigation Wedges



Questions?

