



# *ENERGY AND WATER 5-YEAR STRATEGIC SUSTAINABILITY PLAN*

Submitted to:

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CAMPUS ENVIRONMENTAL SUSTAINABILITY TEAM

Submitted by:

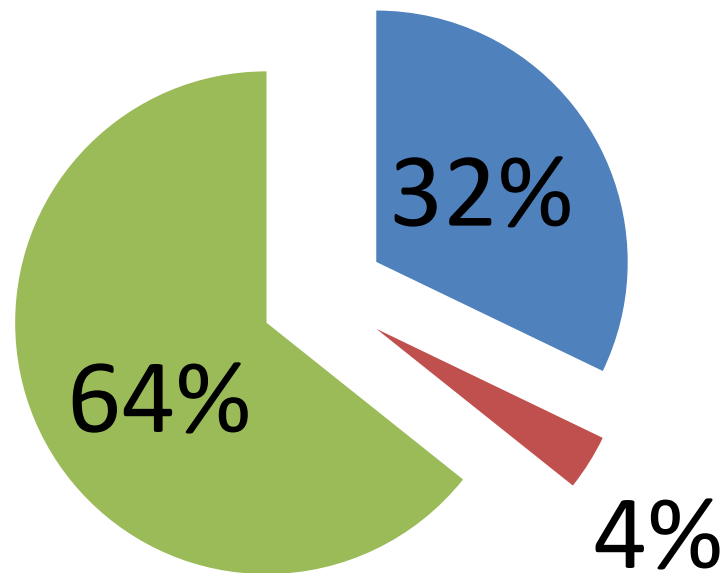
ENERGY AND WATER WORKING GROUP

November 11, 2009



## Energy & Water Working Group Membership (28 participants)

■ Students (9)   ■ Faculty (1)   ■ Staff (18)





ACUPCC institutions have agreed to:

- Complete an emissions inventory.
- Within two years, set a target date and interim milestones for becoming climate neutral.
- Take immediate steps to reduce greenhouse gas emissions by choosing from a list of short-term actions.
- Integrate sustainability into the curriculum and make it part of the educational experience.
- Make the action plan, inventory and progress reports publicly available.



**UNC-GA Sustainability Policy 600.61** – *“The University of North Carolina General Administration is committed to leading the State of North Carolina as an environmental steward that endeavors to proactively and effectively manage its impact on energy, water and other natural resources.”*



N.C. State Government passed Senate Bills 668, 1946, and Session Law 2007-546.

- Energy consumption in all existing State buildings will be reduced by 20% by the year 2010, and 30% by the 2015 relative to fiscal year 2002-03.
- All new State buildings will be 30% more efficient than ASHRAE standard 90.1-2004.
- All State agencies will develop a comprehensive plan to manage and report their utilities each fiscal year to the State Energy Office and Department of Administration.
- New water systems shall be designed and constructed to use a minimum of 20% less potable water than indoor water use baseline calculated for the building after meeting the fixture performance requirements by the 2006 North Carolina Plumbing Code.



Since 2003, NC State has maintained a full time energy management team that manages energy and water through five focus areas:

- Energy Data Management
- Energy Supply Management
- Energy Use in Facilities
- Equipment Efficiency
- Campus Integration



HELPFUL

HARMFUL

INTERNAL ORIGIN

### *STRENGTHS*

- Personnel
- Educational reference
- Interest /momentum
- Team approach
- Technical depth
- Wholesale benefits
- Communication Infrastructure
- Faculty research
- FEEDM, Solar Center, & Advanced Energy
- Student interests in Energy Research
- EWG authority / expertise and diversity
- We have the data!
- Leadership buy-in
- Supply chain upsets
- Managing “Plug loads”
- HVAC management

### *WEAKNESSES*

- Human nature / apathy
- Habits
- Decreasing budget
- Financial priorities
- First cost vs. Life cycle cost
- Energy focus vs. water conservation
- Institutional inertia
- EWG (staff heavy) , need more diversity
- Information flow to students
- Decentralize IT infrastructure
- Purchasing policies
- Aging infrastructure

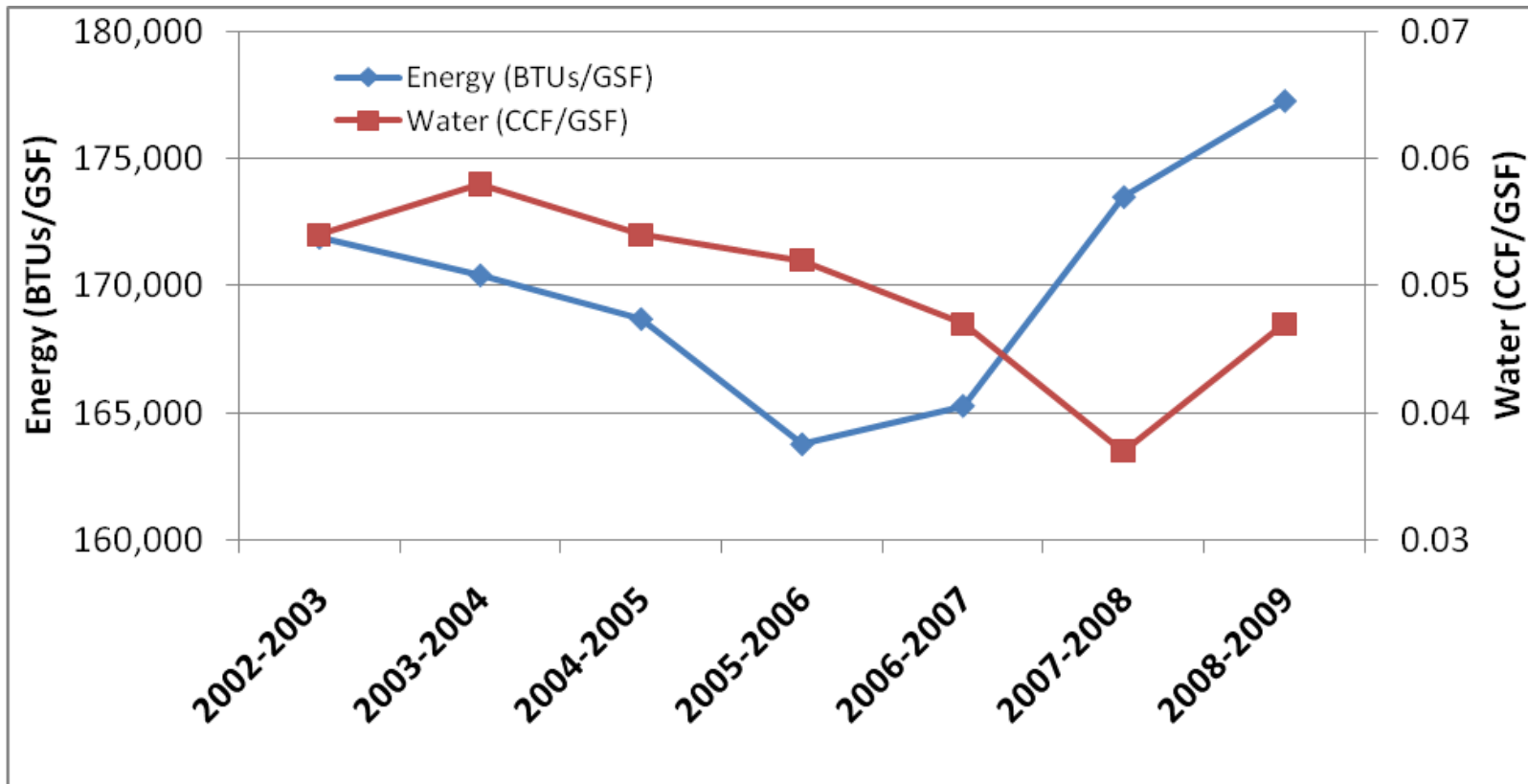
EXTERNAL ORIGIN

### *OPPORTUNITIES*

- Educating upper management / campus
- UNC GA Standards
- Going green is “COOL”
- Learn from others / benchmarking
- Raleigh re-use water
- Energy Star Member
- Regional example
- Vendor partnerships (CREE et al.)
- By law / State and federal
- Project Greenlight (IT)
- Carbon credits revenue
- Water perception
- Grants available
- U.S. legislation

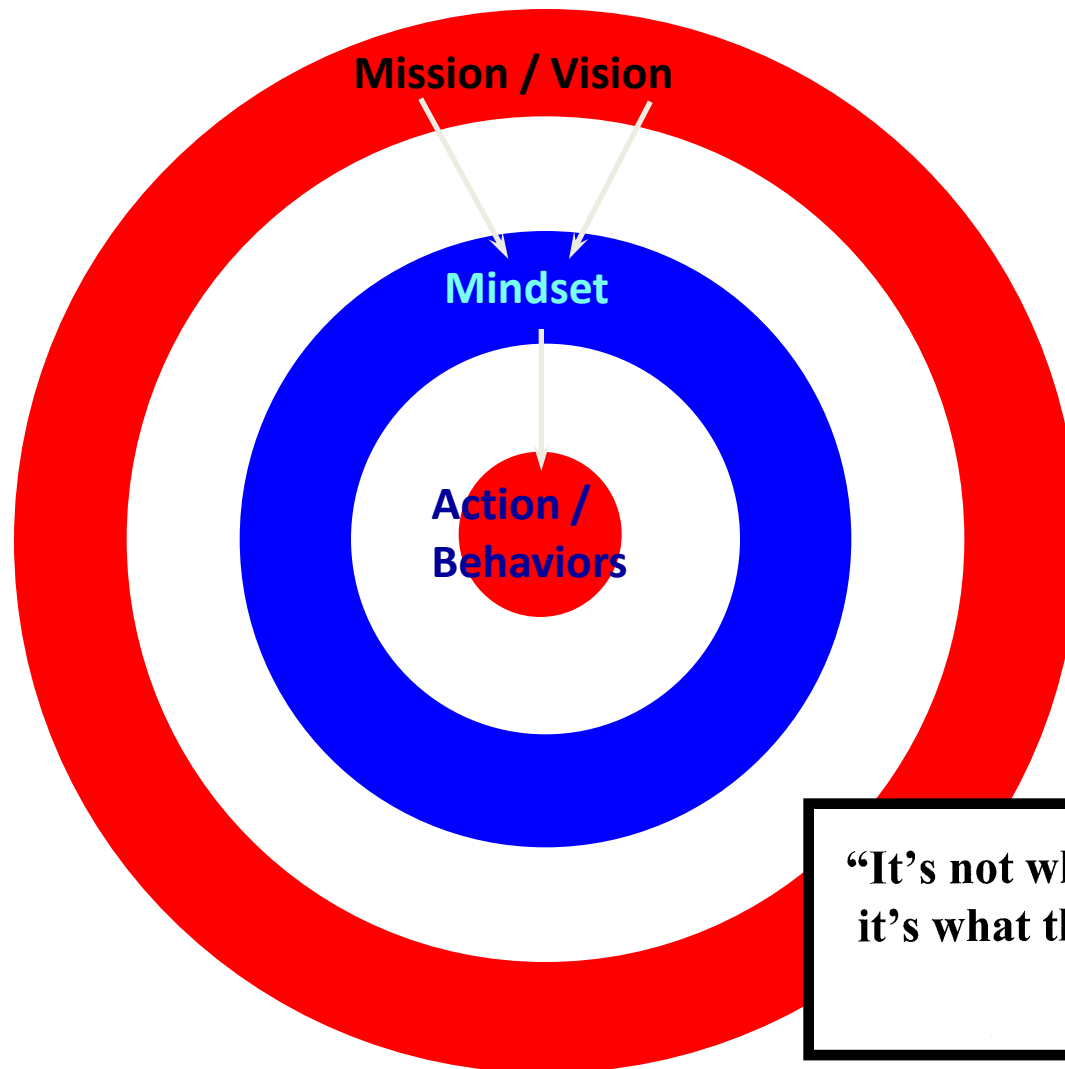
### *THREATS*

- Monetary silos
- Current economy – funding
- GHG inventory / lack of standardization
- Time
- Technology rapid changes
- Financing models
- Industry Best Practices vs. Innovation
- Supply chain upsets



*In fiscal year 2008-09, NC State has:*

1. Increased energy consumption in BTUs per gross square foot by 2.2%, with an overall increase of 3.1% since FY 2002-03.
2. Rebounded 26.6% to near pre-drought water consumption, while still maintaining 29.4% percent reduction from the FY 2002-03 levels .
3. Grown in gross square footage by 0.5%, with a total expansion of 23% compared to FY 2002-03. Developed an additional 2.6% in student enrollment, with a total increase of 7.5% over FY 2002-03.



**“It’s not what the vision is,  
it’s what the vision does.”**

**-Robert Fritz**





**New Building Construction and Major Remodels:** *Capital project planning and construction processes shall be as innovative as possible to meet or exceed statutory energy and water efficiency requirements and deliver energy and water in a manner that minimizes the impact on the environment.*

**Campus Operations and Maintenance:** *The operation and maintenance of buildings, equipment and grounds shall meet or exceed statutory requirements to reduce energy and water use, provide excellent air quality and comfort, improve productivity of faculty, staff and students. Further, priority shall be given to the purchase and installation of high-efficiency equipment and facilities as part of an ongoing sustainability action plan following life cycle cost guidelines where applicable.*

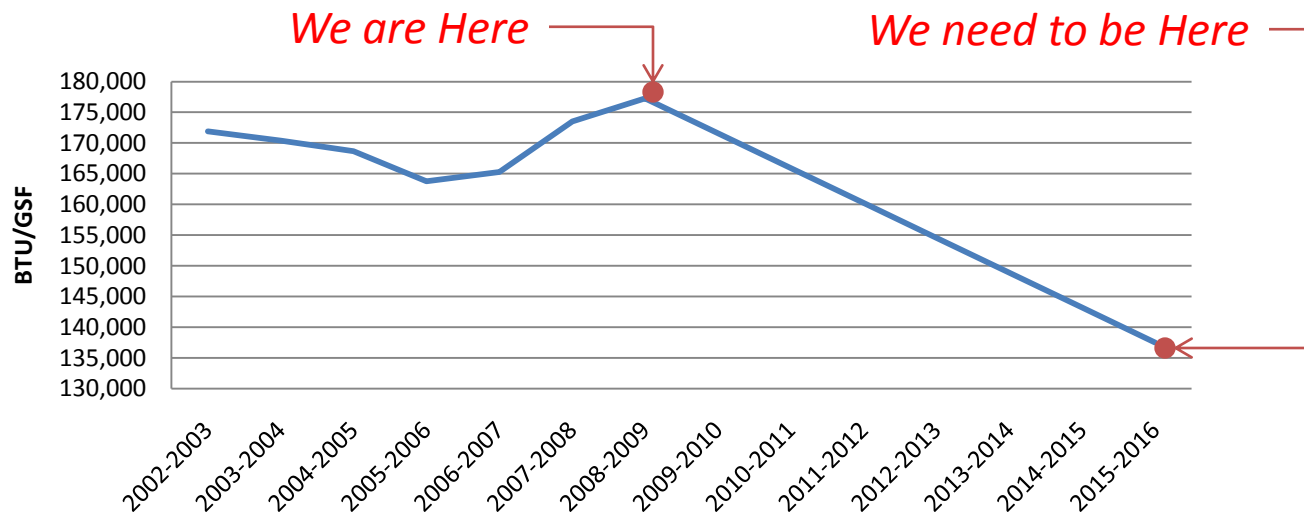


**Education and Outreach:** *The University will engage the campus community to create educational programs and initiatives that foster an environment of increased awareness resulting in measurable and sustainable reduction in energy and water use.*

**Climate Change Mitigation and Renewable Energy:** *The University will adopt an Energy Policy and develop a Climate Action Plan to become climate neutral as soon as practicable and by 2050 at the latest. The University will actively participate in national and international cooperative initiatives that pursue the development of green and sustainable technologies.*

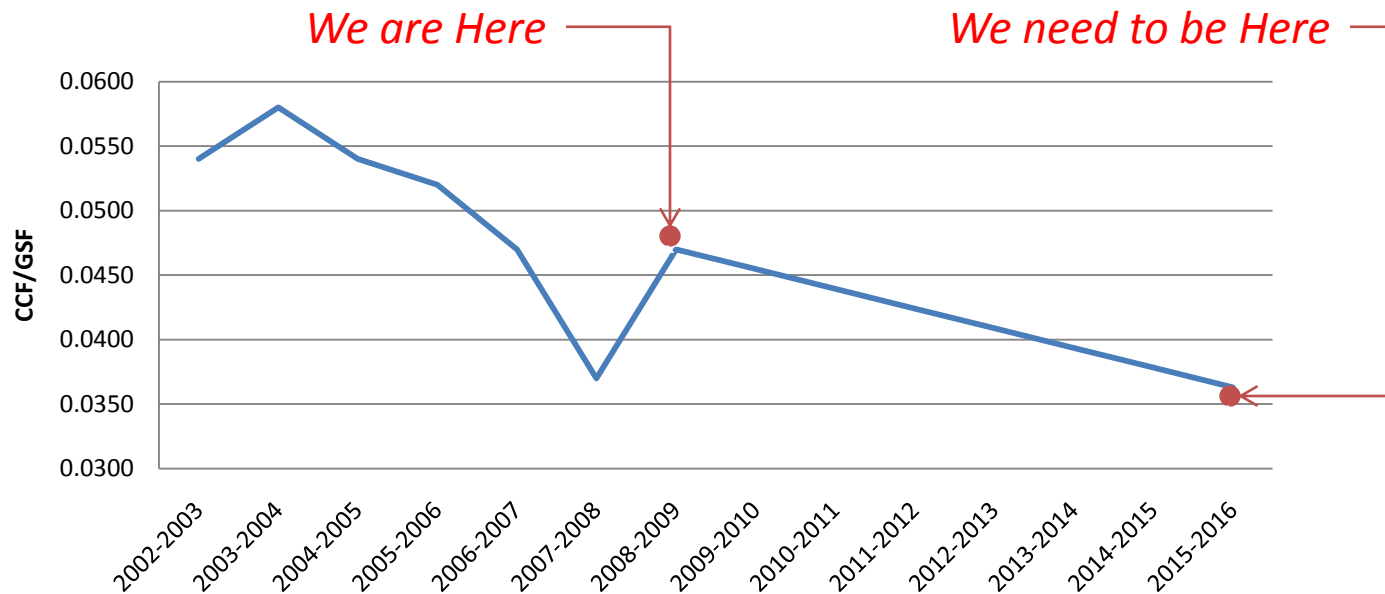


**Energy** – NC State will achieve a 20% reduction in building energy consumption by 2015 ( target reduction to 137,510 BTUs/GSF), with a stretch goal of achieving a 30% reduction (target reduction to 120,322 BTUs/GSF), compared to the 2002-2003 baseline (171,888 BTUs/GSF).





**Water** – NC State will achieve a 45% reduction in building water consumption through 2015 (target reduction to 0.0363 CCF/GSF), with a stretch goal of achieving a 50% reduction (target reduction to 0.033 CCF/GSF), compared to the 2001-2002 baseline (0.066 CCF/GSF).





*The strategies will be achieved through an 11-point tactical program.*

1. Strong Program Leadership
2. Enhanced Energy Awareness aligned with CEST and CAP
3. Aggressive Energy Conservation Policies (e.g., NC State Energy & Water Policy)
4. Engaged Facility Operations
5. Energy Smart Repair and Renovation Capital Programs
6. Identify and Address Poor Energy Performing Buildings
7. More Energy Performance Contracting
8. Green Computing Best Practices
9. Incentive-ize Energy Conservation
10. Build High Performing Buildings
11. Document and Report Savings



# *QUESTIONS?*