



NC State University

Office of Energy Management

Strategic Energy and Water Plan Update

**Fiscal Year 2004-2005**

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**Promoting campus sustainability through the managed use of energy !**

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Attached: Strategic Energy and Water Plan Commitment for NC State University

## **Executive Summary**

The Office of Energy Management at NC State University recognizes that by being good stewards of our energy resources we will maintain a quality environment while reducing consumption and controlling costs. In the Strategic Energy and Water Plan Commitment for NC State University, we have established the goal of reducing the Aggregate Annual Energy Consumption per Gross Square Foot, adjusted for weather, by a minimum of 4% over a ten year period and the Annual Water Consumption Per Gross Square Foot by a minimum of 10% over 2001-02. This Strategic Energy and Water Plan guides our activities in five focus areas: Energy Data Management, Energy Supply Management, Energy Use in Facilities, Equipment Efficiency, and Campus Integration.

In Fiscal Year 2004-05, the NC State campus experienced over a ten percent growth in campus square footage due to the 2000 Bonds for Higher Education. The expenditures for utilities increased from \$21 million dollars in 2003-04 to \$24.1 million in 2004-05. While total utility costs increased, the university avoided paying about \$1 million for utilities through rate schedule changes and gas/oil negotiations. The energy consumption per square foot adjusted for weather and the utility cost per square foot both increased in FY2004-05. NC State University is currently meeting and maintaining the goal for water consumption per square foot.

## Introduction

North Carolina State University, located in Raleigh, North Carolina, is a land grant University with approximately 35,000 students, faculty and staff. NC State is a leader in the areas of teaching, research and public service. Facilities Operations through the Office of Energy Management has been charged with the responsibility to manage the energy resources purchased and consumed by NCSU in the most cost efficient manner and to promote energy conservation and awareness throughout the campus community. NC State is experiencing phenomenal growth. In the last year our campus grew by 10% with the commissioning of over 1,000,000 square feet of new classroom, office, laboratory and dormitory space. Our activities must support a superior academic environment and continued growth while simultaneously accomplishing our primary conservation responsibilities.

**Our Mission:** The *Office of Energy Management* recognizes that by being good stewards of our energy resources we will maintain a quality environment while reducing consumption and controlling costs. This will be accomplished by creating a culture that is dedicated to achieving environmental sustainability by supporting conservation objectives and recognizing and eliminating waste.

**Our Vision:** The vision of this office will be to sustain a long-term reduction of 20% in unit consumption of energy that is purchased by NCSU. In the Strategic Energy and Water Plan Commitment for NC State University, we have established the goal of reducing the Aggregate Annual Energy Consumption per Gross Square Foot, adjusted for weather, by a minimum of 4% over a ten year period. We will reduce the Annual Water Consumption Per Gross Square Foot by a minimum of 10% over 2001-02.

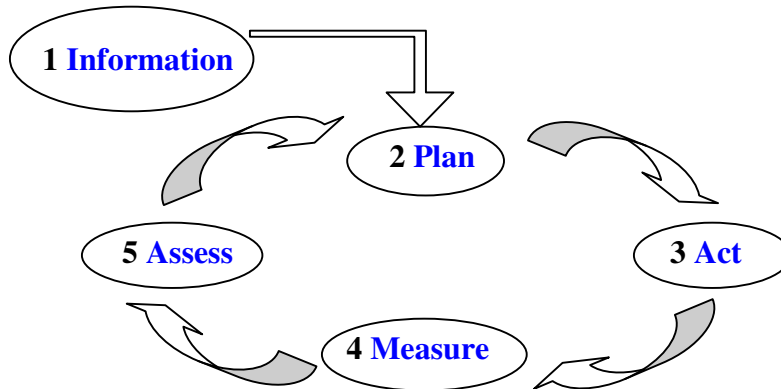
**Our Staff:** Fiscal year 2003-2004 was the inaugural year for the *Office of Energy Management* at NC State. The office was established in August 2003 with the appointment of Ed Sekmistrz as the new Energy Management Engineer. In September 2003, an Energy Conservation Coordinator was hired. The office was expanded in 2004-05 with the hiring of four Electronic Technicians and a dedicated Meter Reader.

**Our Implementation Strategy:** Energy management in a complex ever-changing environment is as much a journey as a destination. Growth, new technologies, environmental concerns, availability of fuels and new regulations and codes are a few of the challenges we must navigate. The Energy Management Plan is the roadmap we use to establish our objectives and guide our activities. A matrix, based on our Energy Management Plan, was created to track the progress of our activities. The Plan's five focus areas, Energy Data Management, Energy Supply Management, Energy Use in Facilities, Equipment Efficiency, and Campus Integration are being implemented using a five-step approach.

1. Information Gathering – The first step in the execution of any project or activity is to identify the sources of information available, gather that information and present it in a meaningful and understandable form.
2. Plan – Based on the information gathered in step one an action plan should be developed. This will include procedures for execution of the project, the goals for the project and the indicators that will be used to measure the success of the project.
3. Act – The actual execution of the plan.
4. Measure – Monitor and report on the key indicators as outlined in the plan.

5. Assess – Review and evaluate the findings and continue with the plan or revise as required.

This is an ongoing process as most activities and projects in the realm of energy management are dynamic, hence the depiction of the implementation strategy as a circle.



## Activities and Accomplishments 2004-05

As stated earlier, the Energy Management Office plan includes five focus areas: Energy Data Management, Energy Supply Management, Energy Use in Facilities, Equipment Efficiency, and Organizational Integration. Highlights from the accomplishments for FY 2004-05 in each of these focus areas is described below.

### ***Energy Data Management***

- A new software program, INSTEP, was installed to manage utility data and generate utility reports. The system will be used to manage purchased utilities (i.e. electricity from Progress Energy and Natural gas from PSNC) and metering of utilities distributed to campus buildings.
- Campus meters were located and mapped.

### ***Energy Supply Management***

- The OEM continues to carefully monitor electric accounts to ensure that we are still on the lowest cost rate schedule as the campus continues to grow. In 2004-05, the university was able to avoid a substantial monthly facilities fee as the demand on Centennial Campus grew to meet projections.
- NC State brought two chiller plants online in 2004-05

### ***Energy Use in Facilities***

- The NC State Construction guidelines for Basic Mechanical, Motors, Mechanical Insulation, Plumbing, and Lighting continue to be updated and posted on the University Architect website.

## Equipment Efficiency



- Replaced incandescent EXIT light signs with LED style lamps in five campus buildings with plans for more in the coming year – estimated savings of \$7,000 per year.
- A pilot lighting replacement project was completed in the Squash Courts at Carmichael – estimated savings per court of \$1,000 per year. This project will continue in 2005-06.
- Programmable controls were installed on five AHU in the Rockwall and Gymnasium area of Carmichael Gym. These AHU now operate based on occupational hours and ambient conditions – estimated savings of \$2,500 per year.
- Steam and chilled water lines were re-insulated in four appropriated buildings.
- Faucet Aerators (0.5 gpm) were installed in the bathrooms of ten appropriated buildings this year and will continue to be installed – this low cost measure has an estimated payback of less than one year.

## Campus Integration

It is evident that awareness amongst the student body of NC State about energy issues has increased and 2004-05 was an active year!

- The OEM launched their website [www.ncsu.edu/facilities/energy](http://www.ncsu.edu/facilities/energy)
- The Million Dollar Challenge was initiated, a campaign for students, faculty, and staff to help save NCSU \$1 million dollars in utility charges by individually saving \$0.15 each day.
- Energy Awareness stickers are being displayed at the entrances to campus buildings.
- The OEM supported student groups and events including Students for Sustainable Energy, the Alternative Energy Fair organized by the Campus Greens, and Energy Awareness Week organized by the Parks Scholars.
- The State Energy Office Director, Larry Shirley, spoke to students about renewable energy potential in NC, and what students can do to help save energy here at NC State.
- OEM helped organize and sponsor the NCSU's largest Earth Day event in the brickyard with over 40 exhibitors including the NC State Energy Office, the NC Solar Center, Students for Sustainable Energy, NC Green Power, and Electrical Equipment Company. Also, there was a variety of alternative fuel and efficient cars on display including a 100% Veggie Oil car, B100 Biodiesel vehicle, a Honda Insight, and a Honda Civic.
- The Energy Management Engineer completed the State Energy Office Diploma Series
- The Electronic Technicians attended training sessions for Johnson and TAC Controls which is used throughout the campus for equipment on buildings and plants.
- The Energy Management staff is being trained on the new utility data collection and billing software system INSTEP



## Charting NC State's Utility Consumption

The OEM is currently responsible for managing purchased utilities for most buildings on main campus and several research facilities. The OEM reports on both utilities purchased from vendors (such as Progress Energy and PSNC) and demand side utilities provided to individual campus facilities.

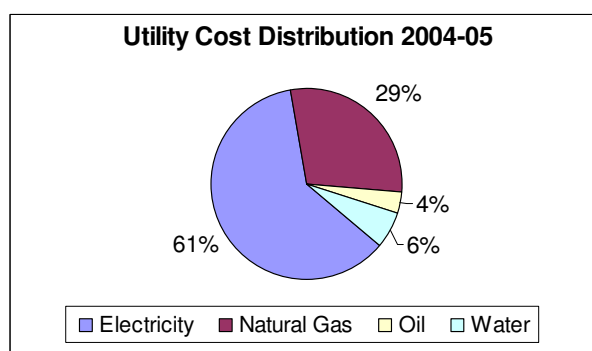
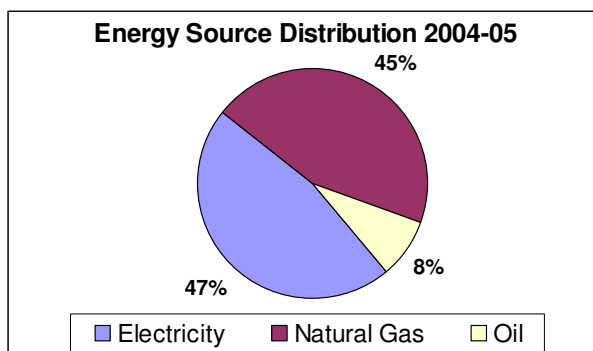
- Purchased Utility Accounts: 115 electric, 87 natural gas, 73 domestic water/irrigation
- Demand Utility Meters: 171 electric, 54 steam/condensate, 139 cold water, 41 domestic and heating hot water, 16 chilled water

These meters are read each month and entered into the new software system. Currently, the demand side data is used primarily to monitor consumption by receipt-funded entities such as University Housing and Dining. The data presented below is based on the supply side data, or utilities purchased by the NC State through OEM.

Due to the 2000 Bonds for Higher Education, NC State is undergoing a period of high growth and expansion. In FY 2004-05, the campus added about 1,000,000 square feet of buildings for which NC State is responsible for providing utilities. Therefore, the utility budget has continued to increase accordingly. In addition to considering growth in utility budgeting, cost of each utility fluctuates from year to year. There has been a significant increase in fossil fuel prices this year, which directly impacts the prices of natural gas and electricity for the university in the future.

### ***Facts about Energy and Water Consumption at NCSU in 2004-05***

- Total amount spent on utilities in FY 2004-05 was over \$24 million
- Electricity accounts for 45% of total energy consumed, but 60% of our utility cost.
- Nearly another 30% is spent on heating buildings and for providing hot water.
- About 6% is spent on purchasing water which is used for irrigation, personal hygiene, make-up water, and in research laboratories.
- Electrical account rate schedule changes have saved \$247,000 to date, over \$61,000 in FY 2004-05
- Natural gas rate negotiations avoided about \$1 million in charges in FY 2004-05



### **Total Energy and Water Consumption 2004-05**

The total energy and water consumption as reported to the State of North Carolina is presented below.

<b>Utility</b>	<b>Consumption</b>	<b>Units</b>	<b>Consumption</b>	<b>Units</b>	<b>Cost</b>
<b>Electricity</b>	253,811,512	kWh	866,259	Million BTU	\$ 14,724,378.73
<b>Natural Gas</b>	8,334,841	therms	833,484	Million BTU	\$ 6,981,944.92
<b>Fuel Oil #6</b>	1,028,558	Gal	154,284	Million BTU	\$ 850,521.92
<b>Fuel Oil #2</b>	15,766	Gal	2,184	Million BTU	\$ 21,798.07
<b>Total Energy</b>			<b>1,856,210</b>	<b>Million BTU</b>	<b>\$ 22,578,643.64</b>
<b>Water</b>	445,573,128	Gal	595,686	CCF	\$ 1,497,310.92

### **Key Performance Indicators 2004-05**

As stated in the Energy and Water Mandate, NCSU has established a goal to reduce the Aggregate Annual Energy Consumption per Gross Square Foot, adjusted for weather, by a minimum of 4% over a 10 year period based on the Key Performance Indicators listed below. We will reduce Annual Water Consumption Per Gross Square Foot by a minimum of 10% over the baseline year 2001-2002.

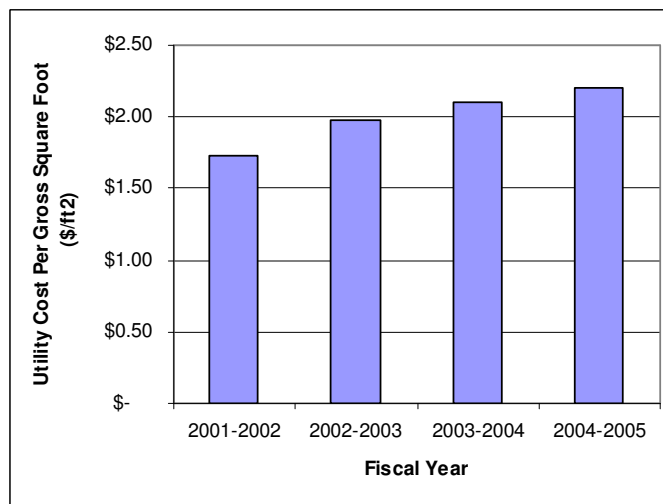
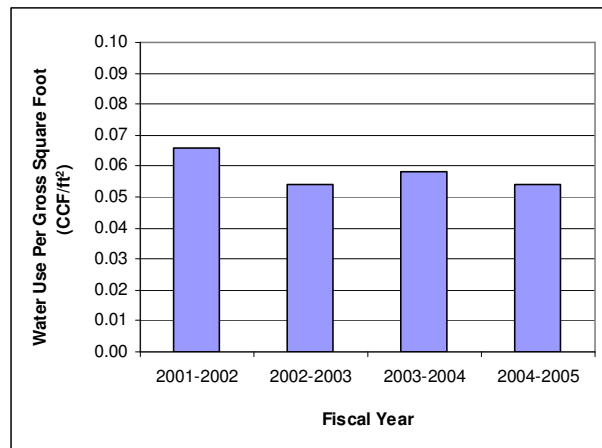
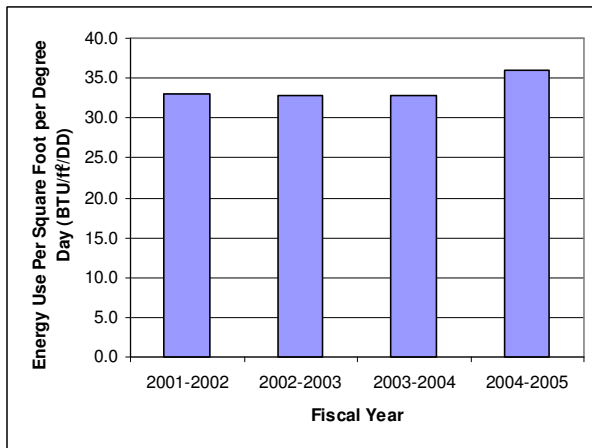
<b>Fiscal Year</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
<b>Utility Cost per GSF</b>	\$ 1.73	\$ 1.98	\$ 2.10	\$ 2.18
<b>Energy Cost per Thousand GSF per DD</b>	\$ 0.341	\$ 0.357	\$ 0.378	\$ 0.437
<b>Energy (BTU) Consumption per GSF per DD</b>	33.1	32.8	32.9	35.9
<b>Water Cost per GSF</b>	\$ 0.119	\$ 0.106	\$ 0.137	\$ 0.135
<b>Water Consumption (CCF) per GSF</b>	0.066	0.054	0.058	0.054
<b>Heating and Cooling Degree Days (DD)</b>	4,710	5,248	5,180	4,670
<b>Campus Area, Gross Square Feet (GSF)</b>	9,796,638	9,910,619	9,986,663	11,056,592
<b>Sponsored Award Activity (Million \$)</b>	\$ 168.2	\$ 169.5	\$ 208.6	\$ 199.5
<b>Utility Cost per Student (\$/FTE)</b>	\$ 584	\$ 701	\$ 743	\$ 854

## Trends in Energy and Water Consumption at NCSU

Energy and water use and cost depend on weather and campus growth (people and building square feet). NC State is currently meeting the goal of reducing long-term water consumption by 20% over the baseline year 2001-2002. Water conservation practices were implemented in response to the drought of 2002-03 and have been maintained.

The energy use per square foot is beginning to trended down this year from 2003-04. However, annual energy consumption per gross square foot, adjusted for weather is trending upward. Some of this increase in weather normalized energy per square foot may be due to the addition of laboratory space which require 100% outside air and therefore have higher heating and cooling loads. Because the gross square footage increased by over 10% this year and many buildings are still under construction, it is difficult to draw conclusions about the future trend of energy consumption.

There has been a significant increase in fossil fuel prices this year, which directly impacts the prices of natural gas and electricity for the university. The cost of water has also increased. Therefore, while conservation measures are implemented to reduce the overall consumption, the cost per square foot will continue to increase.



## Avoided Costs

The Office of Energy Management focuses on both saving money (and avoiding cost) and energy. The following table summarizes monetary savings to date realized through the rate schedule changes and gas/oil negotiations.

Description of Activity	Recorded Avoided Costs Fiscal 02-03 to Fiscal 04-05	Avoided Costs Fiscal 04-05	Total Avoided Costs Recorded to Date
Progress Energy – 14 accounts changed from standard service to Time Of Use	\$185,287	\$61,898	<b>\$247,285</b>
Natural gas negotiations – Transport Vs. PSNC Tariff rate	\$253,471	\$242,951	<b>\$552,943</b>
Natural gas negotiations – Alternate Fuels (Oil/NG) Vs Transport rate	\$537,738	\$736,807	<b>\$1,470,298</b>

In addition to avoiding expenditures through rate changes and negotiations, further costs are avoided through conservation projects. A summary of projects that were implemented or started in fiscal 2004-2005 is shown below.

Energy Management and Conservation Projects					
Project Description	Estimated Project cost	Expenditure in 04-05	Annual savings	Simple payback	Status
Repair insulation to steam system piping at Textiles	\$ 11,400	\$ 11,400	\$ 1,140	10.0	Complete
Repair insulation to chilled water lines; Polk, Broughton, Harrelson	\$ 2,580	\$ 2,580	\$ 258	10.0	Complete
Isolate CVM boiler natural gas piping to enable the use of interruptible gas	\$ 5,441	\$ 5,441	\$ 45,000	0.1	Complete
Install programmable controls on AHU units in Carmichael Gymnasium	\$ 20,000	\$ 20,000	\$ 2,500	8.0	Complete
Consolidate natural gas piping at Mckimmon & Visitor Centers	\$ 19,934	\$ -	\$ 7,500	2.7	Completes in Fiscal 05-06
Real-time energy controls and campus-wide metering	\$ 1,800,000	\$ -	N/E	N/E	Continues in Fiscal 05-06
Replace hall lighting at Dabney hall with T8 lighting systems - COP funds	\$ 200,000	\$ -	\$ 20,000	10.0	Continues in Fiscal 05-06
Replace motors with premium efficient motors - COP funds	\$ 200,000	\$ -	\$ 25,000	8.0	Continues in Fiscal 05-06
Replace bath faucet aerators, Main Campus	\$ 11,000	\$ 5,173	\$ 5,173	1.0	Continues in Fiscal 05-06
Install low flow showerheads, Carmichael Gymnasium	\$ 30,000	\$ 4,102	\$ 4,102	1.0	Continues in Fiscal 05-06
Squash Court Lighting Revisions - Carmichael Gymnasium	\$ 50,000	\$ 4,303	\$ 1,000.00	4.3	Continues in Fiscal 05-06
Replace incandescent exit lamps with LED; Main, Centennial & CVM	\$ 45,000	\$ 31,010	\$ 8,860.00	3.5	Continues in Fiscal 05-06
Install computerized system for utility accounting.	\$ 193,500	\$ 134,500	0	0.0	Continues in Fiscal 05-06

N/E – Not Estimated

## Future Plans for 2005-06

Our first two years was spent collecting data, identifying opportunities, implementing pilot solutions, and quantifying the results. From this we developed the basis for guidelines and procedures that will provide the foundation for the conservation measures that will allow us to meet our long-term goal. This year we moved from the information gathering and planning phases to the execution and monitoring phases. Our projected activities will continue implementing conservation practices and assessing their results as outlined below:

- For fiscal year 2005-06, the Office of Energy Management will continue to provide technical expertise and support for the automation systems in the Central Thermal Plants as they come on line.
- We will complete the transition to the new software for the functions of energy management, vendor utility bill reconciliation and internal utility billing on to a single system. By the end of next fiscal year, this will be the sole system for managing energy data.
- We will continue to upgrade and add meters to campus buildings to begin to benchmark and classify buildings on campus. As we add meters and buildings, they will be monitored in the new utility software system.
- The office intends to expand its campus activities and will work with entities that exist already including the Students for Sustainable Energy, University Housing, the Parks Scholars Program, NC Sustainability Coalition, and Campus Environmental Sustainability Team.
- Using the knowledge gained through our pilot programs total building lighting projects will be conducted. These projects will make use of occupancy sensors, re-lamping, de-lamping, and light replacement as appropriate for the area.
- The Conservation Awareness Team will meet as required to track progress on existing projects and identify new opportunities.

The estimated budget expenditures for 2005-06 is shown in the table on the next page.

## Fiscal 2005-06 Estimated Activities and Expenditures

Project Description	Budgeted	Estimated Avoided Annual Energy Cost
<b>Energy Data Management</b>		
Computerized system for utility accounting	\$ 50,000	0
Handheld data recorder	\$ 25,000	0
<b>Energy Supply Management</b>		
Gas/Oil negotiations	\$ 25,000,000	\$ 1,000,000
Electric account/rate analysis		
<b>Energy Use in Facilities</b>		
Update Design Guidelines		
Boiler Study	\$ 200,000	\$ -
Performance contracting study	\$ 75,000	\$ -
Lighting & HVAC Audit; Carmichael	\$ 600	
Lighting Audit; Student Health	\$ 600	
Building Control Tune-ups (4)	\$ 4,000	\$ 4,000
Boiler Tune-ups & Steam Trap Surveys		
<b>Equipment Efficiency, (R&amp;R/CI funds) see note 1</b>		
Low flow shower heads & sink aerators	\$ 130,000	\$ 30,000
Carmichael Gym Squash court lighting revisions.		
Occupancy sensors for halls and class rooms in Thompkins Hall.		
Remote meter reading for vault and ceiling mounted meters		
Trial lighting project using LED street lamp		
Incandescent EXIT light sign replacement with LED style lamps.		
Replace EGRC air-cooled chiller	\$ 350,000	\$ 100,000
Lighting upgrades, (COP funds)	\$ 200,000	\$ 20,000
Control & meter upgrades, (COP funds) see note 2	\$ 1,800,000	N/A
Motors, premium efficient, (COP funds) see note 3	\$ 200,000	\$ 25,000
<b>Campus Integration, see note 4</b>		
Update website	\$ 4,000	0
Publications & handouts		
Place Awareness Labels on Buildings		

Note 1. Funding of \$65,000 expected to continue annually.

Note 2. Activity & expenditures will likely incur in fiscal 2005-06 thru fiscal 2008-09.

Note 3. Activity & expenditures will likely incur in fiscal 2005-06 thru fiscal 2006-07.

Note 4. Funding of \$4,000 expected to continue annually.

# The Strategic Energy and Water Plan

The Office of Energy Management worked with the NC State Energy Office to develop a strategic plan to achieve the goal of reducing long-term reduction of 20% in unit consumption of energy that is purchased by NCSU. The Strategic Plan Matrix allows us to track the details of our activities in each of the five focus areas.

NCSU Energy Management Strategic Plan Matrix					
Focus Area	Phase I	Phase II	Phase III	Phase IV	Phase V
<b>ENERGY DATA MANAGEMENT</b>					
Supply Side Utility-Owned Meters (250)					
Determine information available/required #	Major Development of Task				
Create systems to capture/accumulate data #	Major Development of Task				
Establish Key Performance Indicators #	Major Development of Task	Major Development of Task			
Annual report for SEO #	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task
Initiate reporting #	Major Development of Task	Major Development of Task			
Monthly report for detailed account analysis #		Major Development of Task	Implementation	Implementation	Implementation
Procedures for account maintenance		Major Development of Task			
Demand Side NCSU-Owned Meters (350+)					
Create systems to capture existing data #	Major Development of Task				
Determine information available/required	Major Development of Task	Major Development of Task			
Determine meter type & location requirements	Major Development of Task	Major Development of Task			
Meter additions & repairs		Major Development of Task	Implementation	Implementation	Implementation
Locate & map all existing meters	Major Development of Task	Major Development of Task			
Make Energy Data Accessible to All Users					
Select & purchase utility accounting software		Major Development of Task	Extension of Task		
Transfer supply and demand accounts			Extension of Task	Extension of Task	
Initiate reporting; format & content			Extension of Task	Extension of Task	
Establish benchmarks / bldg rankings		Major Development of Task	Major Development of Task	Extension of Task	
Establish load profiles		Major Development of Task	Extension of Task	Extension of Task	
<b>ENERGY SUPPLY MANAGEMENT</b>					
Price negotiations for deregulated utilities		Implementation	Implementation	Implementation	Implementation
Implement monthly transport NG purchases		Implementation	Implementation	Implementation	Implementation
Implement monthly PSNC rate 160 NG purchases		Implementation	Implementation	Implementation	Implementation
Central Thermal Plants	Major Development of Task	Major Development of Task	Major Development of Task		
Review data for utility accounts		Implementation	Implementation	Implementation	Implementation
Rate schedule optimization		Major Development of Task	Implementation	Implementation	Implementation
Account & meter consolidation		Major Development of Task	Implementation	Implementation	Implementation
Method to verify LGS & LGS-TOU rates #	Major Development of Task				
<b>ENERGY USE IN FACILITIES</b>					
System condition assessments		Implementation	Implementation	Implementation	Implementation
Audits by Energy Mgmt Dept		Implementation	Implementation	Implementation	Implementation
Upgrade equipment & building control systems		Major Development of Task	Major Development of Task		
Maintenance Preventive & remedial		Major Development of Task	Implementation	Implementation	Implementation
Repair/replace decisions		Major Development of Task	Implementation	Implementation	Implementation
Establish operating procedures/guidelines		Major Development of Task	Extension of Task	Extension of Task	Extension of Task
Lighting efficiency guidelines	Major Development of Task	Major Development of Task	Extension of Task	Extension of Task	
Motor efficiencies replacement guidelines	Major Development of Task	Major Development of Task	Extension of Task	Extension of Task	
Building operation guidelines (automation systems)		Major Development of Task	Extension of Task	Extension of Task	Extension of Task
Optimize settings on Building Automation Systems		Major Development of Task	Extension of Task	Extension of Task	Extension of Task
Audits and Tune-ups through SEO				Major Development of Task	Major Development of Task
Boiler Study				Major Development of Task	Major Development of Task
Performance Contracting Study				Major Development of Task	Major Development of Task
Evaluate alternative/renewable fuels for boilers				Major Development of Task	Major Development of Task

- Legend
- Major Development of Task
  - Extension of Task
  - Implementation
  - # Denotes work complete

NCSU Energy Management Strategic Plan Matrix (Cont'd)					
Focus Area	Phase I	Phase II	Phase III	Phase IV	Phase V
<b>EQUIPMENT EFFICIENCY</b>					
Pilot lighting programs #	Major Development of Task	Major Development of Task			
Test effectiveness of occupancy sensors #	Major Development of Task	Major Development of Task			
Reduced flow shower heads and sink aerators	Major Development of Task	Extension of Task	Extension of Task	Extension of Task	
Carmichael Gym Squash Court Lighting			Major Development of Task	Major Development of Task	
Occupancy Sensors in Appropriated Buildings				Major Development of Task	Implementation
LED Exit Lights in Appropriated Buildings			Major Development of Task	Implementation	Implementation
Lighting Upgrades at Building Level				Implementation	Implementation
Replace Inefficient Motors Campus Wide			Major Development of Task	Extension of Task	Implementation
Evaluate Pilot Solar Hot Water Project				Major Development of Task	Major Development of Task
Evaluate Energy Savings Opprotunities in Laboratories				Major Development of Task	Major Development of Task
<b>CAMPUS INTEGRATION</b>					
"Turn It Off" sticker campaign	Implementation	Implementation	Implementation	Implementation	Implementation
Web site	Major Development of Task	Implementation	Implementation	Implementation	Implementation
Presentations	Major Development of Task	Implementation	Implementation	Implementation	Implementation
Campus publications	Major Development of Task	Implementation	Implementation	Implementation	Implementation
Liaisons	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task
Student Groups	Major Development of Task	Implementation	Implementation	Implementation	Implementation
Logo #	Major Development of Task	Major Development of Task			
Controls Systems, Meters, eDNA Training			Major Development of Task	Major Development of Task	Implementation
Energy Management Diploma program #	Major Development of Task	Implementation	Implementation	Implementation	Implementation
SEO workshops	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task	Major Development of Task

Legend

Major Development of Task

Extension of Task

Implementation

# Denotes work complete