

Strategic Energy and Water Plan

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Randolph Community College

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Executive Summary

Randolph Community College is a campus of approximately 3000 students and 300 full and part-time faculty and staff. We have 26 Campus Facilities totaling approximately 345,000 square feet, which are occupied between the hours of 7:30am and 10:00pm nightly. RCC expects to improve energy efficiency continuously by establishing and implementing an effective Energy Management Program while providing a safe and comfortable educational environment. The growth in the number of facilities and size of our student body will increase overall energy consumption, but RCC plans to reduce the consumption and avoid cost by implementing in the short, medium and long term, a series of Energy Conservation Measures.

RCC has established an energy team to make decisions on energy management issues. This team is focused on identifying potential projects, searching for alternative solutions, and deciding on corrective actions. As the projects are identified, the potential solutions are discussed and then assigned a ranking on need and cost. This team in conjunction with our Conserve Committee is committed to finding ways to reduce energy consumption, as well as seek opportunities to be more sustainable environmental stewards.

Key Elements and focus Areas of the Plan

The Energy Plan will provide the framework, at an institutional level, for prioritizing, adopting and implementing both broad and specific energy-related tasks. Key elements include:

- Conservation of energy, water, natural resources and manmade resources.
- Data collection — Accurate measurement and analysis of electricity, fossil based fuels, and water usage to benchmark and develop Key Performance Indicators (KPI), including a quarterly review of trends and costs.
- Plan development — Organizing a support committee for Energy Culture Change to review policies, programs, projects encourage employee participation and innovation
- Expanding employee education and awareness on the benefits of energy resource management and conservation via, electronic email, intranet and handouts.
- Execute approved, prioritized projects of energy efficiency and fuel conservation and implement process improvements, based on Cost Benefit Analysis (CBA) from Energy Assessments, Capital Improvement Plan (CIP) and Best Management Practices
- Advertise success stories through the local and regional media.

Key Initiatives

- Jobs created and maintained using local contractors and advanced training of RCC staff to achieve upgrades for efficiency and Best Practices for preventative maintenance so that we effectively control performance of the equipment and systems.
- We will seek to implement conservation measures that have a simple payback of two to three years.
- Monitoring and Verification measures including commissioning and the utility manager will monthly review utility invoices for accuracy of billing and track consumption to monitor conservation efforts.
- Actively engage Administration to raise awareness and promote reduction in consumption of energy in existing buildings and ensure the planning and design of new facility buildings follow the guidelines of this plan.
- Actively seek to make all future renovations LEED quality. Starting with the operation of our designed LEED Gold project of the new Continuing Education and Industrial Center (CEIC) to be opened in 2013.
- Implement tactics for automated controls to adjust consumption of energy when buildings are unoccupied.
- Further engage faculty, staff, and students to become involved in energy conservation through the Conserve Committee. This committee includes awareness of energy consumption, sustainability, recycling, and green initiatives. The Conserve Committee will stay abreast of new and innovative conservation measures and will advise the campus through news articles, contests, emails, volunteering, and other forms of communication.

Priority Projects for Increased Efficiency and Avoided Costs

- The Business Education Center was constructed in 1988 and is in operation approximately 72 hours per week. This building has a high complaint ratio and was chosen for the A&T State University Audits which were provided by the SEO. A phase I and II audit (appendix C) were conducted and recommendations were made for re-lamping, DDC controls, photo sensors, installation of EERU, economizers, maintenance on chilled water temperatures and exchange of motors on the loop system. The total investment for equipment costs to be \$225,000 and to offer up to a 10% savings with an average of 5.5 year payback. Labor costs are anticipated to increase this estimate. Financial partners with this upgrade would be State Energy Office, Progress Energy and County Capital.

- Built in 1962, the Administrative Education building is the oldest and largest building on RCC's campus and consumes approximately 91,000 kwh per month at its peak. This building houses the majority of RCC's administration and curriculum students. The two-pipe system is original to the building as are most of the VAV boxes and air handlers. AirCon Carolina, Inc. has provided an estimate showing energy savings at 21%. Brady Trane also provided an estimated savings of 22%-28% if equipment renovations were made. Both estimates cost range from \$1.2 – \$1.6M. This project would be a major renovation and include replacement of ductwork, install new controls, replace air handling units, replace one chiller, replace VAV boxes, upgrading lighting to T8 and CFL, and convert the current two-pipe system to a four-pipe system. Funding sought for this project would be four tier: State Energy Office grant, County Capital, and Progress Energy Incentives reimbursement. RCC has met with these funding sources to ensure that this project would qualify for their support, and feels that it would achieve multiple goals. First would be the 20% reduction of power consumption by the State, second would be the comfort levels which have been unacceptable and third would be the reduction in cost of maintenance, repairs and manual operation. Since one of the original boilers has now been taken out of service due to concerns of integrity, we have decided to upgrade it to a more efficient boiler. The project will start in October of 2012.
- The Vocational and Technical Center, built in 1979, is one of the largest buildings on campus and houses approximately 500 – 600 students and faculty daily. Moisture and temperature controls have become increasingly problematic over the last few years. We are discussing installation of new digital controls to the heating and cooling plants. In addition, we propose to add combination variable frequency drives with integral bypass to the supply fan and replace all pneumatic valves to chilled and hot water with electronic modulating valves. With the estimated cost projected to possibly reach \$200,000, we are just in the discussion stage this year.
- Construction of a 47,000 LEED Gold facility began Fall of 2011 and should be completed by January 2013. This new facility will offer many sustainable features including solar, cisterns, chilled beams, ice storage, dashboards, and high efficiency boilers. Funding for this project will be provided by County Capital.

Legislative Basis for the Strategic Energy and Water Plan Creation

We are in agreement with and committed to the statement that “in a concerted effort, Congress, North Carolina General Assembly, and local agencies have set out energy policy statements and objectives” to mitigate climate change by improving energy efficiency standards internally. This plan will serve as our starting point.

Supply Side Strategies

- ❖ Identify the location, meter number, and account number on a campus map to enhance monitoring capabilities.
- ❖ Work with local utility providers to carefully monitor utility accounts to ensure that the lowest cost rate schedule is in effect for each facility. Rate schedule verification will be completed every two years.
- ❖ Work with consulting groups to audit and make recommendations to use most economical source of energy. (ie: gas or solar vs. electric equipment) A&T State University has performed audits on two campus buildings and has made energy efficiency recommendations. Continue to partner with Progress Energy to obtain matching funds for continued technical assistance with building audits. NCSU extension agents will help provide technical assistance with Strategic Plan, data analysis, site plan development of metering and RFP design for upcoming projects.
- ❖ Verify meter readings and billing rates on monthly utility supplier’s invoices.
- ❖ Work with local utility providers for recommendations of future cost savings plans and initiatives available through their company. Progress Energy currently is providing assistance with the Lighting Rebate and KWH Saved Incentive Reimbursement programs for all buildings on campus that qualify for these programs. This year we have received \$30,000.00 in incentive rebates from Progress Energy.
- ❖ Monitor all local provider rates and savings plans to ensure our provider is offering competitive rates. Progress Energy Representatives as well as outside sources (Electric Solutions) assist in reviewing rate structure to ensure that each building is on best possible rate.
- ❖ Communicate with the State Energy office to be knowledgeable of projected costs increases or savings initiatives that should be available.

Demand Side Strategies

- ❖ Initiate a guideline for lighting, motors, mechanical equipment and computers for maintenance.
- ❖ Apply for more energy grants to provide assessments and directions for more energy efficient facilities. Work with local utility provider on incentive programs offered.
- ❖ Initiate more internal energy reviews of HVAC equipment to tune equipment to maximum efficiency. Work with Delta Controls to develop extensive preventative maintenance schedule. Consult local providers for retro-commissioning projects.
- ❖ RCC plans to demolish older portions of buildings in the coming years which should reduce energy consumption by constructing more energy efficient facilities. Rehabilitation of the Klaussner Building using commissioning agents, SEO, Progress Energy and county funding will offer Randolph County's first LEED Gold facility.
- ❖ RCC has initiated a flex schedule which will allow reduction of energy usage on Fridays and weekends. Consolidate weekend building use to most efficient buildings.
- ❖ Any building envelop renovations will consider converting single pane windows and under insulated roofs in design to help meet higher efficiency.
- ❖ Continual monitoring of plug loads to make sure individual refrigerators and space heaters are kept at home.
- ❖ Install automated controls on lighting and HVAC equipment including occupancy sensors and timers, and DDC controls.
- ❖ Require equipment to be replaced with Energy Star Rating units.
- ❖ Create a replacement schedule for older, less efficient air handlers.
- ❖ Use solar thermal on the roof for hot water
- ❖ Research solar field lease to feed main grid
- ❖ Expand the Check Programs to collect more critical data on our boilers and chillers.
- ❖ Continue to upgrade our Building Automation System to incorporate all types of energy management systems on all three campuses

Focus B: Demand Side Strategies

Strategy 1.	Conducting energy audits to identify opportunities for conservation.							
Strategy 2.	Complete Cost Benefit Analysis for opportunities and appropriately prioritize projects based on probable benefit and available resources.							
Strategy 3.	Benchmarking and developing Key Performance Indicators (KPIs) that clearly measure real energy and water conservation progress, factored for facility growth.							
Past Year Activities (2011-2012)	Measurement		Savings		Investment	Jobs	Accountability	Funding Source
	Expected	Actual	Expected	Actual				
NCSU Technical Assistance	All buildings	All	Analysis Only	\$0	Free	1	NCSU Staff	State Energy Program
DDC Controls /LRC Center	1 Building	1 Bldg	\$8,300/yr	TBD	\$40,000	3	Energy Manager/Conservation Specialist	County Capital /Progress Incentive
Commissioning	1 building	In progress	80%	In progress	\$50,000	2	LEED firm	County Capital
Re-lamp areas of campus replace that still have T-12 with T-8's	All Bldgs	18 Bldgs	20%	TBD	\$5,000	3	Staff Electrician Energy Manager	County Capital
2012-2013 Activities	Measurement		Savings		Investment	Jobs	Accountability	Funding Source
	Expected	Actual	Expected	Actual				
Boiler Upgrade	AE Bldg		10%		\$50,000	2	HVAC Tech.	County Capital
HVAC Renovation	BEC Bldg.		15%		\$200,000	3	Facilities Director	County Capital Progress Energy
LEED GOLD FACILITY	Klaussner Bldg.		25%		\$7,000,000	9	Various Firms	PC, SEO, County Progress Energy
Investigate HVAC renovation	VT Building		\$7000/yr		\$200,000	3	Conservation Specialist	County Capital Progress Incentive
Lighting upgrade	Petty Bldg		\$1000/yr		\$5000	2	Staff Electrician	County Capital

Behavioral and Cultural Change Strategies (Organizational Integration, Communication and Training)

- ❖ Increase energy awareness through news articles, brochures, and emails. Progress Energy's Current Lines publication to be distributed quarterly.
- ❖ Created Energy Committee to get the student organizations and faculty association involved. CONSERVE committee to involve energy conservation, recycling, and education. A logo has been designed for immediate recognition of the "Conserve" initiative. The awareness campaign includes banners, posters, and notices designed to make the campus body understand and buy-in to the measure we are taking to meet our goals.
- ❖ Involve upper administration to get support from the top down.
- ❖ Involve new Conservation Specialist in promoting and educating Facilities staff as well as the Campus body on new and existing sustainable measures.
- ❖ Incorporate energy conservation themes with campus wide meetings and creating a professional development segment to be offered to faculty and staff.
- ❖ Incorporate Strategic Energy Plan into RCC's Master Facilities Plan and new employee orientation.
- ❖ Publicize through Campus Cruiser, News & Views Newsletter, RCC Users and flyers the 19 components that RCC recycles and the contractors, staff and outlets in which we collect and dispose of all recycled materials and other sustainable measures.
- ❖ Send support staff and maintenance personnel to ongoing training, continuing education and State Energy Office programs to increase our knowledge of new technology and sustainable standards.
- ❖ Encourage curriculum to get more involve in sustainability and conservation.

Focus C: Behavioral and Cultural Change Strategies

Strategy 1.	Training and effective use of Maintenance and Facilities employees to perform planned service and upgrades to maintain and improve the performance of the facility equipment and vehicles to reduce energy waste.							
Strategy 2.	Organize support for Energy Culture change and implement CONSERVE  initiative.							
Strategy 3.	Incorporate Strategic Energy Plan into RCC's Master Facilities Plan.							
Past Year Activities (2011-2012)	Measurement Expected Actual		Savings Expected Actual		Investment	Jobs	Accountability	Funding Source
CONSERVE Awareness e-mails & News letter to entire campus	monthly	12	Unknown		Free	1	Conserve Members	Salary
Energy Committee – CONSERVE Awareness Meetings	Qrtly meetings	3	Unknown		20 hrs/yr	1	Facilities Director	Salary
Progress Energy's Current Lines publication	6 per yr	6	Unknown		Free	1	Energy Manager	Salary
Recycle Light Bulbs	1 per yr	1	Unknown		\$1800	1	Southeast Recycling	Contractor
2012-2013 Activities	Measurement Expected Actual		Savings Expected Actual		Investment	Jobs	Accountability	Funding Source
CONSERVE Awareness e-mails	monthly				Free	1	Conserve Members	Salary
Staff Development	2 per yr				\$500	1	Maintenance Staff/Conservation Specialist	County/Salary
Progress Energy's Current Lines publication	4 per yr				Free	1	Energy Manager	Salary
Human Resources to reflect an energy initiative in the orientation process	Monthly				Free	1	HR	Salary

Water Management, Supply, Facilities, Equipment & Organizational Integration Strategies

- ❖ Identify the location, meter number, and account number on a campus map to enhance monitoring capabilities. Individual meters per building for better monitoring.
- ❖ Expand building monitoring for leaks or misuse of water.
- ❖ Continue to upgrade our current facility with: low flow toilet fixtures, minimize use of potable water for landscaping, motion sensors, low flow water saving aerators, implement the use of cisterns.
- ❖ Create a replacement procedure to replace water lines and insulate lines in our older buildings.
- ❖ Upgrade toilet facilities with hands free devices that will monitor distribution.
- ❖ Increase awareness on water conservation – showing examples of cisterns, rain water barrels, and drip irrigation technology.

Focus D: Water Management, Supply, Facilities, Equipment & Organizational Integration Strategies

Strategy 1.	Implement an effective leak reporting and repair program.							
Strategy 2.	Develop water conservation measures.							
Strategy 3.	Monitor water usage and verify meter readings.							
Past Year Activities (2011-2012)	Measurement Expected Actual		Savings Expected Actual		Investment	Jobs	Accountability	Funding Source
Install no hand devices as older units fail	5 fixture	5	\$100	\$0		2	Maint. operations	Salary
Verify all water meter reading quarterly	10 meters	10	\$0	\$0	10 hr	2	Maint. operations	Salary
Created utility spreadsheet to monitor usage and billing cycles	Monthly	Monthly	\$1000	\$1800	2 hrs/mo	1	Utility Manager	Salary
2012-2013 Activities	Measurement Expected Actual		Savings Expected Actual		Investment	Jobs	Accountability	Funding Source
Create ways to recycle rainwater – cisterns					Unknown	1	Consultant	Grants
Install water efficient devices campus wide					\$100/fixture	2	Maint. operations	Grants/county capital
Initiate water conservation awareness campaign					4 hrs	1	Utility Manager	Salary