

**Western Carolina University**

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**2008-2009  
Strategic Energy Plan**

**Submitted October 16, 2009  
Energy Management Office  
Facilities Management**



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## **1. Mission Statement**

*To develop smart energy solutions in all aspects of our institution and create a comprehensive approach for leading the Western Carolina University community towards a sustainable future.*

## **2. Executive Summary**

Western Carolina University (WCU) continues to expand its efforts in the area of waste reduction, lowering energy costs, developing new programs and reducing our carbon "Paw Print". One of our focuses has been on the development of pursuing an Energy Service Performance Contract (ESPC) for several buildings on our campus. This includes Ramsey Activity Center, Hunter Library, Stilwell Science Building, Hoey Auditorium, McKee Building and Coulter Building. In October 2008, we posted an RFP to select an Energy Service Company (ESCO). The process was guided by Celtic Energy, Inc., our 3<sup>rd</sup> Party Owner's Representative, whom we selected in July 2008. In March 2009, we chose ConEdison Solutions, Inc. as our ESCO for ESPC. Due to unforeseen delays, the Investment Grade Energy Audit will commence September 2009. The scope of energy conservation measures for this project will include improvements to HVAC, lighting, building envelope, water, energy management controls, building HVAC controls, central chiller plant, solar hot water heating, solar photovoltaic's, rain-water harvesting, plug load management, steam system and campus-wide sustainability programming.

In 2007-08 we continued our campus energy conservation program "Reducing Our Carbon Paw Print", formerly known as WHEE Save. The purpose of this program remains the same, which is to educate faculty, staff and students about energy

consumption and how it affects the economy, environment and our overall footprint on the Earth. Our goals are to raise awareness about the ecological and economical benefits of conserving energy, teach methods on how to reduce energy consumption on campus, have a positive impact on long term energy consumption habits of our university community and lower overall energy consumption. Our comprehensive approach for this program includes informational materials, class lectures, organizing events and involvement with faculty, staff and student groups. Due to the current state of the economy, budget constraints were imposed on our efforts. We had to employ creative measures for conveying our message and educating the WCU campus community.

In February 2009 we organized an event called the National Teach-In. This was a nationwide affair for discussing topics of sustainability that occurred simultaneously across the country in schools of higher education and K-12. We had a variety of activities including a film festival, numerous workshops and informational fair. In April 2009 Energy Management and Eco CATS, a student organization, organized and celebrated Earth Day on the University Center Lawn. This festival included live music, games and an informational fair.

### **3. Consumption Data**

Table 1 below summarizes our energy usage over the past 7 years. Overall, our energy performance has remained stable. Total utility cost and energy consumption increased as expected, primarily due to rising fuel costs and an increase in total gross square footage (GSF-See Table 2).

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**Table 1: WCU Energy Performance, 2002-to-2008**

YEAR	TOTAL UTILITY COST \$	\$/MM BTU	\$/ GSF	BTU / SQ.FT.	% CHANGE, BTU/SQ FT (cumulative)
2002-2003	\$3,075,813	\$6.35	\$1.14	178,764	0
2003-2004	\$3,300,828	\$9.18	\$1.26	136,616	-24%
2004-2005	\$3,798,840	\$9.59	\$1.25	129,989	-27%
2005-2006	\$4,288,287	\$12.77	\$1.45	113,548	-36%
2006-2007	\$4,404,131	\$11.66	\$1.43	123,042	-31%
2007-2008	\$4,873,216	\$12.89	\$1.61	124,607	-30%
2008-2009	\$4,406,505	\$11.59	\$1.43	122,962	-31%

This improvement is primarily a result of retiring old equipment, installing new equipment with higher operating efficiencies, actively managing building occupancy schedules, building improvements and successful educational programs for faculty, staff and students. Since the beginning of the Utility Savings Initiative in 2003, the combined benefits of these items reflect a reduction of energy consumption per gross square foot of 31%. We are concerned that our energy performance will decrease as we bring new buildings online and retrofit existing facilities with superior HVAC systems in the coming year.

**3. Consumption Data (See Table 2 – attached)**

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**4. Energy Tactics Table**

**A. Energy Demand Management**

Past 12 months Activities 2008-2009	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Review of Energy Usage for all campus facilities	Monthly	Monthly			10 hours/month	1	Energy Manager	FM Operating Budget
Utilize Itron Enterprise Energy Management (EEM) Suite Software	Monthly	Monthly			10 hours/month \$13,250	2	Energy Manager Energy Management Specialists	FM Operating Budget
Installation of meters at Ramsey Activity Center, Hunter Library, Fine & Performing Arts, Stillwell, HF Robinson, McKee, Center for Applied Technology	Interval readings for electric, water and steam condensate	Interval readings for electric, water and steam condensate.			\$245,819	4	Energy Manager	R & R
All new buildings will be submetered and integrate into Itron EEM Suite. New construction includes: Courtyard Dining, Balsam & BlueRidge Residence Hall	Monthly & Interval	Monthly & Interval				4	Energy Manager Energy Management Specialists	Capital
Energy Service Performance Contract	Quarterly		TBD	TBD	5.25M	30	Energy Manager ConEdison Solutions, Inc.	Private Source
Replaced 864 shower heads and 1057 faucets aerators with low flow fixtures in Residence Halls. 1.5 gpm shower heads and 0.5 gpm aerators.	Monthly (Aug & Sept)	Monthly		2,197,700 gal and \$6,812.87 (\$3.10/1,000gal)				NC Energy Reserve Fund Grant
HF Robinson Administration Building Retro-Commissioning	Monthly	Monthly			\$80,000	3	Energy Manager	NC Energy Reserve Fund Grant
Replace roof on Killian Annex and Reynolds Hall (reflective white membrane)	Monthly	Monthly			\$170,000	6	FM Project Manager	R & R & Residential Living

Next 12 months Activities 2008-2009	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Energy Service	Quarterly	Quarterly	TBD	TBD	5.25M	30	Energy Manager	Private

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Performance Contract							ConEdison Solutions, Inc.	Source
New Health & Gerontological Building Silver LEED Certified	Monthly & Interval	Monthly & Interval			42M	35	FM Project Manager	Capital
Install T-8 electronic ballast for lighting when replacing bad T-12 and magnetic ballasts	10 ballasts/ week					7	FM Electric Shop	FM Operating Budget
Continued to monitor campus wide heating and cooling temperature set points, exceptions and building schedules based on state mandate requirements and University Policy #4	Weekly	Weekly				2	FM HVAC Shop Energy Manager	FM Operating Budget
Warehouse Re-Lighting	Monthly	Monthly	TBD	TBD	\$15,000	6	FM Electric Shop Energy Manager	NC Energy Reserve Fund Grant

**B. Energy Supply Management**

Past 12 months Activities 2008-2009	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Review of Energy Usage for all Auxiliary facilities	Monthly	Monthly			10 hours/month	1	Energy Manager	FM Operating Budget
Review natural gas rates for steam plant consumption. Incurred savings thru matching fuel costs	Monthly	Monthly			1 hour/month	2	Business Officer	FM Operating Budget
Utility Rate Schedule change from LG (Large Service) to OPT-G (Optional Power Time-Of-Use)	On-Going	On -Going				3	Energy Manager	FM Operating Budget
Energy Service Performance Contract	Quarterly		TBD	TBD	5.25M	30	Energy Manager ConEdison Solutions, Inc.	Private Source
Perform steam trap survey to assess system issues	Annually	Annually				21	FM HVAC & Plumbing Shop	FM Operating Budget
Repaired leaky steam lines during steam shut-down in May	Annually	Annually				21	FM HVAC & Plumbing Shop	FM Operating Budget

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**C. Organizational Integration**

Past 12 months Activities 2008-2009	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Continue campus wide energy conservation awareness and education program.	On-going	On-going			10 hours/month	1	Energy Manager	FM Operating Budget
Member of WCU Wellness Council as Energy/Sustainability representative	On-going	On-going			2 hours/month	10	Wellness Coordinator	Student Affairs
Updated Strategic Energy Plan	Annually	Annually			20 hours/year	1	Energy Manager	FM Operating Budget
Presented display table at WCU Employee Appreciation Day and other campus events as needed	Annually	Annually			4 hours/year	1	Energy Manager	FM Operating Budget
Member of UNC Sustainability Committee (Operations and Maintenance Sub-Committee). Developing UNC system wide policy on sustainability.	On-going	On-going			15 hours	1	Energy Manager	FM Operating Budget
Organized campus event. National teach-in on sustainability and Earth Day.	Annually	Annually			20 hours/year	1	Energy Manager	FM Operating Budget
Teach LEAD 143-02 Eco PEAKS, (leadership and sustainability) in Fall 2008. Class is in Western PEAKS, a freshman year experience living-learning program.	Annually	Annually			40 hours/year	2	Energy Manager Asst. Director Facilities Residential Living	FM Operating Budget Residential Living

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Advisor for Eco CATS Student Club, advisor for Clean Energy Initiative & advise collaboration with other student clubs	On-going	On-going			20 Hours per month	1	Energy Manager	FM Operating Budget
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Next 12 months Activities 2008-2009	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Create WCU Sustainability Council	Monthly	Monthly			10 hours/month	1	Energy Manager	FM Operating Budget
Continue campus wide energy conservation awareness and education program.	On-going	On-going			10 hours/month	1	Energy Manager	FM Operating Budget
Member of WCU Wellness Council as Energy/Sustainability representative	On-going	On-going			2 hours/month	10	Wellness Coordinator	Student Affairs
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Advisor for Eco CATS Student Club, advisor for Clean Energy Initiative & advise collaboration with other student clubs	On-going	On-going			20 Hours per month	1	Energy Manager	FM Operating Budget

## Energy Declaration

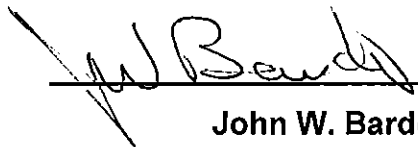
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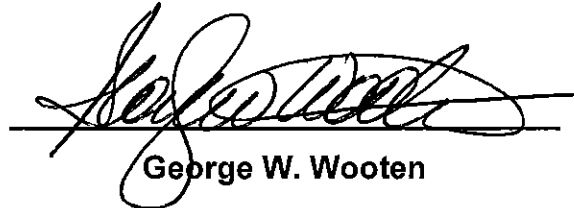
I have read the Strategic Energy and Water Plan for Western Carolina University.  
The plan, as presented, supports the reduction required in Senate Bill 668.

Implemented this 4th day of November, 2009.



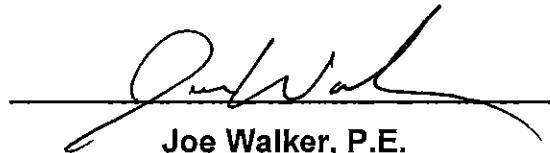
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John W. Bardo  
Chancellor



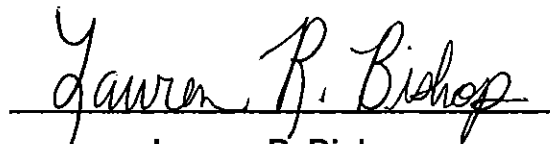
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George W. Wooten  
Vice Chancellor for Administration and Finance



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Joe Walker, P.E.  
Associate Vice Chancellor for Facilities Management



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Lauren R. Bishop  
Energy Manager